

Service Manual

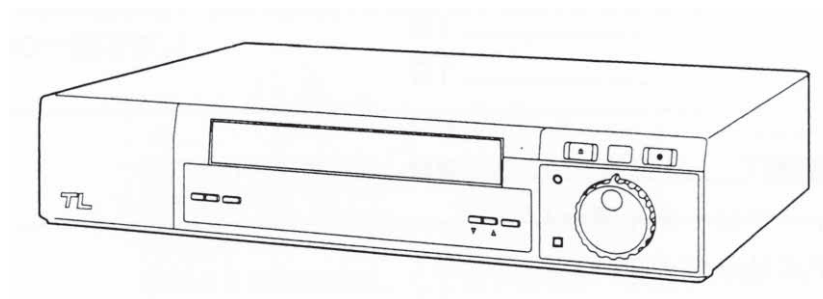
VHS

Time Lapse Recorder

AG-RT650P

Z-MECHANISM

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Please refer to the information of Z-Mechanism (Order No. VSD9706M201, VRD9802005C2)

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products deal with in this service manual by anyone else could result in serious injury or death.

Specifications

Power Source: 120 V AC, 50 – 60 Hz
Power Consumption: 20W

Video Recording

System: 4 rotary heads, helical scanning
Tape Speed: 11.12 mm/s (8-hour mode)
 3.71 mm/s (24-hour mode)
 2.22 mm/s (40-hour mode)
Tape Format: Tape width 12.7 mm (1/2 inch),
VHS tape
Recording Time: 8 hours (with NV-T160, 8H mode)
FF/REW Time: Less than 2.5 min. (with NV-T160)

VIDEO

Television System: EIA Standard (525 lines, 60 fields)
 NTSC color signal
Modulation System: Luminance; Frequency modulation
 recording
 Color Signal; Converted subcarrier
 phase shift recording
Input: Video Input (BNC); 1.0 Vp-p,
 75 ohms, unbalanced
Output: Video Output (BNC); 1.0 Vp-p,
 75 ohms, unbalanced
Horizontal Resolution: Color; More than 300 lines
 B/W; More than 300 lines
S/N: B/W; Better than 45 dB (8-hour mode,
 DETAIL OFF)
 Color; Better than 43 dB (8-hour mode,
 DETAIL OFF)

AUDIO

Input: Audio Input (Phono);
 –10 dBV, 47 kohms, unbalanced
 Mic (Mini-jack);
 –60 dBV, 600 ohms, unbalanced
Output: Audio Output (Phono);
 –8 dBV, 1 kohm, unbalanced
Tracks: 1 track (Normal)

Recording/Playback Time

Modes: 8/24/40 hours mode


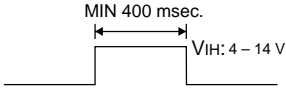
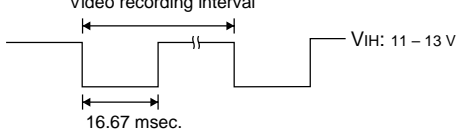
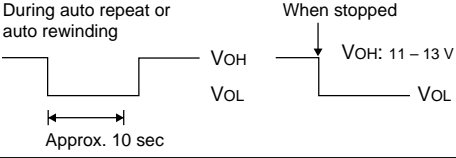
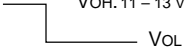
CONNECTORS

Alarm Input/REC IN: Contact closure
Alarm Reset Input: +4 V – +14 V

Operating Temperature: 41 °F – 104 °F (5 °C – 40 °C)
Operating Humidity: 35% – 80%
Weight: 8.36 lbs (3.8 kg)
Dimensions: 16-15/16"(W) × 3-1/2"(H) × 11-9/16"(D)
 430 × 88 × 293.5 mm

Weight and dimensions shown are approximate.
 Specifications are subject to change without notice.

Input/Output Terminal Signal Level

Terminal	Signal Level	Note
Alarm Input/REC IN		LOW Input
Alarm Reset Input		HIGH Input
Camera Switching Output		VOH = 11 – 13 V (5.6 k) VOL = 0 – 0.6 V (max. 3 mA)
Tape end output		VOH = 11 – 13 V (4.7 k) VOL = 0 – 0.6 V (max. 3 mA)
Warning output		VOH = 11 – 13 V (4.7 k) VOL = 0 – 0.6 V (max. 3 mA)

SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohm meter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. The resistance value must be more than $5M\Omega$.

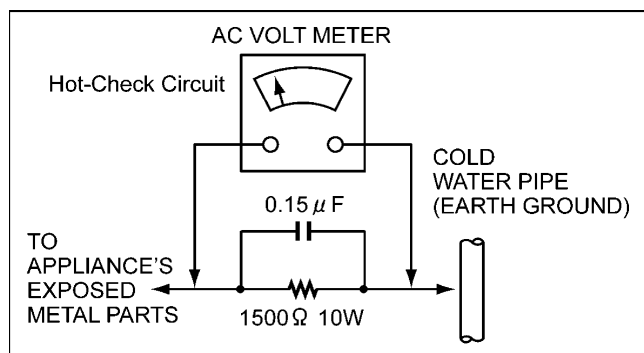


Figure1

LEAKAGE CURRENT HOT CHECK (See Figure 1)

1. Plug the AC cord directly into the AC outlet.
Do not use an isolation transformer for this check.
2. Connect a $1.5k\Omega$, 10W resistor, in parallel with a $0.15\mu F$ capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet repeat each of the above measurements.
6. The potential at any point should not exceed 0.15 volts RMS. A leakage current tester (Simpson Model 229 equivalent) may be used to make the hot checks, leakage current must not exceed 0.1 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground.
Alternatively, obtain and wear a commercially available discharging wrist trap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it.
(most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
CAUTION : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpacked replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

X-RADIATION

WARNING

1. The potential source of X-radiation in EVF sets is the High Voltage section and the picture tube.
2. When using a picture tube test jig for service, ensure that jig is capable of handling 10kV without causing x-radiation.

Note : It is important to use an accurate periodically calibrated high voltage meter.

3. Measure the High Voltage. The meter (electric type) reading should indicate $2.5kV, \pm 0.15kV$. If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure. To prevent an x-radiation possibility, it is essential to use the specified picture tube.

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SECTION 1

OPERATING INSTRUCTIONS

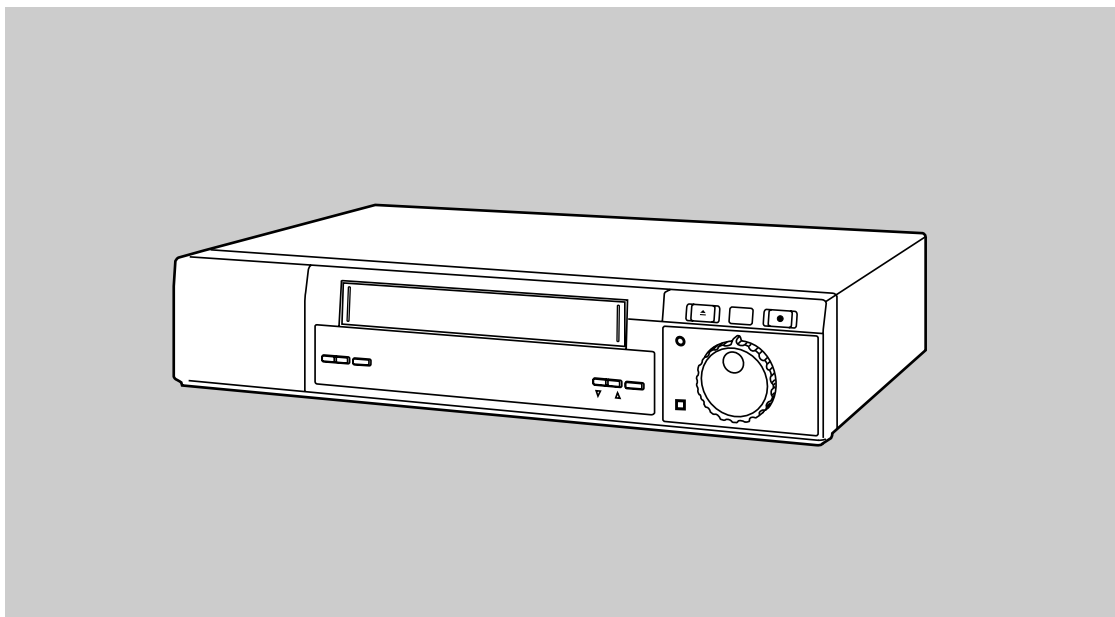
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Operating Instructions

Time Lapse Recorder

Model AG-RT650_P



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Before attempting to connect, operate or adjust this product, please read these instructions completely.

IMPORTANT

“Unauthorized recording of copyrighted television programs, films, video tapes and other materials may infringe the right of copyright owners and be contrary to copyright laws.”



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

CAUTION:

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

CAUTION:

Do not install or place this unit in a bookcase, built-in cabinet or in another confined space in order to keep well ventilation condition. Ensure that curtains and any other materials do not obstruct the ventilation condition to prevent risk of electric shock or fire hazard due to overheating.

WARNING:

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

FCC Note:

This device complies with Part 15 of the FCC Rules. To assure continued compliance follow the attached installation instructions and do not make any unauthorized modifications.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Lithium Battery

Replace battery with part No. VL2330/1HF only. Use of another battery may present a risk of fire or explosion.
Caution—Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

 is the safety information.

- Do not insert fingers or any objects into the video cassette holder.
- Avoid operating or leaving the unit near strong magnetic fields. Be especially careful of large audio speakers.
- Avoid operating or storing the unit in an excessively hot, cold, or damp environment as this may result in damage both to the recorder and to the tape.
- Do not spray any cleaner or wax directly on the unit.
- If the unit is not going to be used for a length of time, protect it from dirt and dust.
- Do not leave a cassette in the recorder when not in use.
- Do not block the ventilation slots of the unit.

- Use this unit horizontally and do not place anything on the top panel.
- Cassette tape can be used only for one-side, one direction recording. Two-way or two-track recordings cannot be made.
- Cassette tape can be used for either Color or Black & White recording.
- Do not attempt to disassemble the recorder. There are no user serviceable parts inside.
- If any liquid spills inside the recorder, have the recorder examined for possible damage.
- Refer any needed servicing to authorized service personnel.

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Features

Recording and playback in 24- and 40-hour time modes with the NV-T160 tape

In addition to the 8-hour time mode, recording and playback can be performed in the time lapse modes (24- and 40-hour modes).

Excellent defined still-picture images

More clearly defined still picture images can be produced during playback in color and black-and-white modes thanks to the horizontal resolution of more than 300 lines.

Full line-up of recording functions

Included in the wide range of recording functions are restoration-of-power-after-failure recording, recording every day and by the days of the week using the internal timer, external timer recording, alarm recording, emergency recording and repeat recording.

Playback functions

Among the convenient playback functions are the recording review function for immediate viewing of recorded material, the handy search function for locating images promptly, and the forward/reverse field advance and still-picture functions for careful viewing of particular scenes.

Repeat recording count display

The number of times a recording is to be repeated can be indicated on the counter display.

Jog/shuttle

A jog or shuttle function for quickly locating playback sections using the search dial is incorporated.

Auto tracking function

The tracking can be automatically adjusted by pressing the “-” and “+” tracking buttons together.

Built-in time/date generator

This unit comes with a built-in microprocessor with a calendar function for displaying the time on the display or TV monitor and for controlling the time of the internal timer.

Recording lock function

A double recording mode lock function is provided for safeguarding against operational errors during recording.

Connection to sequential switcher

Easy connection to a sequential switcher is possible once the unit has been connected to the video input and camera SW connectors.

Hour meter

The unit contains an hour meter which provides useful information for maintenance and inspections.

Remote control

The unit can be operated from a distance of about 16 ft. if the AG-A11 remote controller, available as an optional accessory, is connected.

Regular Maintenance Service Recommendation

Although this unit is designed to withstand long-term use, the items listed below should be inspected regularly so that the unit is kept in perfect working order. Use the hour meter to know when to conduct the inspections.

The VTR is a piece of precision-made equipment and, as such, it is recommended that the user enter into a maintenance and inspection agreement to keep the unit operating free of trouble or failures. For further details, please consult with your dealer.

Cumulative operation time (hours)										
	500	1000	1500	2000	2500	3000	3500	4000	8000	12000
Inspection item										
Transport system cleaning	●	●	●	●	●	●	●	●	●	●
Audio heads	●	●	●	●	●	●	●	●	●	◎
Video heads	●	●	●	●	●	●	●	◎	◎	◎
Cylinder unit	●	●	●	●	●	●	●	●	●	◎

◎ Service life inspection

● Cleaning

(24-/40-hour mode use)

The above table merely serves to lay down general guidelines for the inspection of typical parts involved in regular inspections. The timing of the inspections needs to be adjusted according to the VTR's operating environment.

Routine & Regular Inspection Request

This unit is designed to withstand many hours of operation. Nevertheless, it is recommended that routine inspections be conducted to help ensure trouble-free operation.

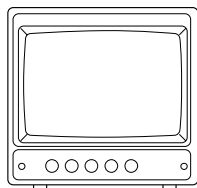
CAUTION

Do not forget to conduct the routine inspection with auto repeat recording.

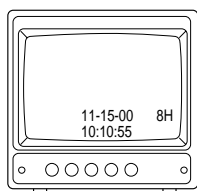
Routine inspection procedure

- 1 Set the power switches on the unit, video cameras, TV monitor and other equipment connected in the monitoring system to the ON position.

- 2 Is the picture on the TV monitor OK?



- 3 Are the date and time displayed on the TV monitor correct?



- 4 Rewind the cassette tape, which was recorded on the previous day, by an amount equivalent to a count on the counter of several figures.



- 5 Press the TIME MODE button to set to the mode to 8H (8 hours).



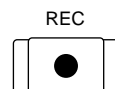
- 6 Press the PLAY button. The tape is played back by an amount equivalent to a count on the counter of several figures.



- 7 Is the playback image OK?

- 8 Is there any problem with the recorded date and time?

- 9 Press the REC button.



- 10 Check the playback images which were recorded in the 8-hour time mode.

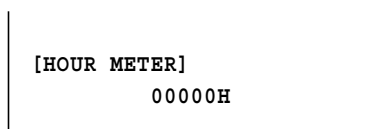
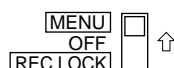
- 11 Upon completion of all the checks, set the unit to the desired mode.

Action taken after routine inspections

In the unlikely event of a problem with the unit, turn off the power, take hold of the power plug and disconnect it from the power outlet, and consult with the dealer from whom the unit was purchased.

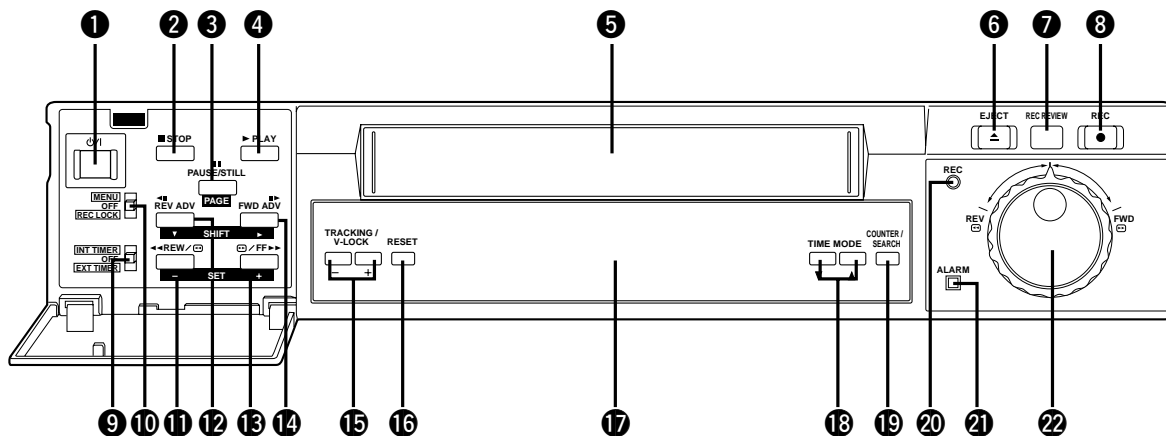
Regular inspections recommended

This unit has an hour meter which shows for how many hours the VTR has been used. When the MENU/REC LOCK switch is set to MENU, Menu Screen 1 appears on the TV monitor, and the hour meter can be checked. Use the hour meter as a rough guideline to cleaning or replacing the parts inside the unit. For further details, consult with your dealer.



TV monitor

Part and Their Functions



1 POWER switch/lamp

The power is turned on when this switch is pressed. When the switch is pressed again, the power is turned off.

2 STOP button

When this is pressed, the tape stops traveling.

3 PAUSE/STILL (page) button

When this is pressed during recording, the tape temporarily stops traveling. When pressed during playback, the tape temporarily stops traveling, and a still picture appears on the TV monitor. When pressed again, the tape travel resumes. The pages on the menu screen are advanced when the button is pressed while a menu screen is displayed.

4 PLAY button

Playback starts when this button is pressed.

5 Cassette holder

This is the loading slot for the video cassette.

6 EJECT button

This is used to eject the video cassette.

7 REC REVIEW button

When the button is pressed during recording, the tape runs temporarily in the reverse direction, and after the recorded section has been played back, the unit is returned to the recording mode.

8 REC button

Recording starts when this button is pressed.

9 TIMER MODE button

This is the operation switch for internal timer recording or external timer recording. The displays shown below light on the display panel.

INT: At the times set by the internal timer, the power is automatically turned on or off and recording starts or stops.

OFF: When timer recording is not performed.

EXT: When the external power is turned on, recording starts automatically.

10 MENU/REC LOCK switch

When this switch is set to REC LOCK, the time mode and operation buttons as well as the power switch cannot be operated while recording is in progress.

When it is set to MENU, the menu screen appears.

11 REW (set -) button

When this button is pressed, the tape is rewound. When it is kept depressed during playback, the review mode is established. When a menu screen is displayed, it is used to change an item (decrement a value).

12 Field REV ADV (shift ▼) button

When this is kept depressed during still-picture playback, the picture is advanced field by field in the reverse direction. When it is released, the still picture reappears. When it is pressed while a menu screen is displayed, the setting items move downward.

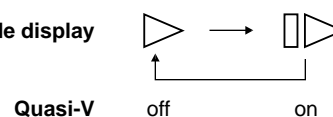
13 FF (set +) button

When this is pressed, the tape is fast forwarded. When it is kept depressed during playback, the unit is placed in the cue mode. When a menu screen is displayed, it is used to change an item (increment a value).

14 Field FWD ADV (shift ►) button

When this is kept depressed during still-picture playback, the picture is advanced field by field in the forward direction. When it is released, the still picture reappears. When this is pressed during 24- or 40-hour mode playback, Quasi-V on/off can be selected.

Operation mode display



Dancing can be reduced.

When it is pressed while a menu screen is displayed, the setting items move toward the right.

15 Tracking (–, +)/V-LOCK button

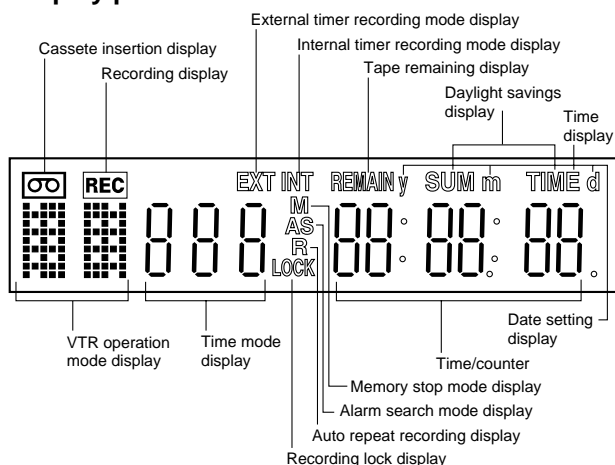
These buttons are used to adjust the tracking. If noise appears on the playback picture, press the buttons to adjust the tracking in such a way that the picture is made as clear as possible. When both buttons are pressed together during 8-hour mode playback, the tracking is adjusted automatically. If the image shakes slightly in the vertical direction during still picture, press V-LOCK buttons to reduce the dancing.

Further, the time/date display position can be adjusted during STOP and EJECT (see page 13).

16 RESET button

When this button is pressed, the counter display is reset to 0:00:00.

17 Display panel



• Operation mode displays

Operation mode	Display
Playback	▶ or ◀▶
Recording	▶ REC lamp lights.
Still picture	◻◻
Recording pause	◻◻ REC lamp lights.
Recording check	▶ REC lamp lights.
Fast forwarding	▶▶
Rewinding	◀◀
Cue	▶▶
Review	◀◀
Forward field advance	◻◻ or ▶▶ (Flashing)
Reverse field advance	◻◻ or ◀◀ (Flashing)

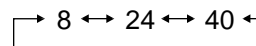
• Error messages

An error code appears when trouble has occurred during operation.

- E-2:** Trouble in video cassette insertion area
- E-3:** Trouble in video cassette tape loading area
- E-4:** Trouble in cylinder area
- E-5:** Trouble in tape transport area
- d:** Formation of condensation (dew)

18 TIME MODE (▼, ▲) buttons

These buttons are used to select the recording and playback time mode. Each time this is pressed, the time mode changes in the following sequence:



19 COUNTER/SEARCH button

When this button is pressed, the display on the display panel changes to time, counter, counter memory, alarm search and number of repeat recording display.

The “M” mark appears on the display panel in the counter memory mode. When the tape is fast forwarded or rewound in this mode, the counter will automatically stop when 0:00:00 is approached. The “AS” mark appears on the display panel in the alarm search mode. When the tape is fast forwarded or rewound in this mode, the unit is automatically set to still-picture playback at the alarm recording section. If the FF button or REW button is pressed during playback with alarm search, the search will lock. (If this button is pressed while the tape is being fast forwarded or rewound, counter memory and alarm search will not function.)

The “PAS.” mark appears in the display panel in the number of repeat recordings display mode. The number of repeat recordings is displayed only when TAPE END in Menu Screen 4 is set to REPEAT. The “__PAS” mark is displayed for settings other than REPEAT.

20 REC display lamp

This lamp lights while recording is in progress. It goes off when recording has finished.

21 ALARM display lamp

This remains lighted while alarm recording is in progress. It flashes when alarm recording ends.

22 Search dial/jog dial

Search (outside ring) dial

When the outside ring of the search dial is turned, the search mode is established. The tape can now be reviewed or cued at up to 27 times the normal playback speed. When the search dial is set to the center click-stop position, the still-picture playback mode is established.

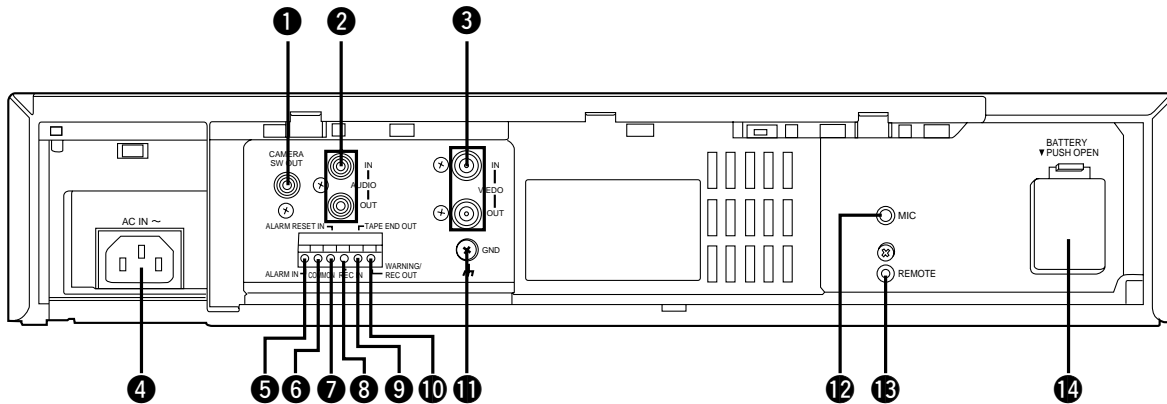
Jog (inside ring) dial

When the search dial is set to the center click-stop position, the jog mode is established.

When the inside ring is turned, the tape speed can be varied within a range of –1 to +1 times the normal playback speed. When the turning is stopped, the still-picture playback mode is established.

- During search or jog playback, the picture may appear in black and white or it may be distorted: this is normal and not indicative of malfunctioning.
- No sound is heard during search or jog playback.

Part and Their Functions



① Camera switching output connector

Camera switching output connector; connect it to the sequential switcher.

② Audio input/output connectors

Audio input/output connectors (phono jacks)

③ Video input/output connectors

Video input/output connectors (BNC); connect the input connector to the video camera, etc. and the output connector to the TV monitor, etc.

④ AC IN connector

Connect the supplied power cord to an AC outlet.

⑤ Alarm input connector

Alarm recording input connector; connect it to the external sensor.

⑥ COMMON terminal

⑦ Alarm reset connector

Input connector for releasing alarm recording; a +4 to +14 V DC voltage is required.

⑧ REC IN connector

Input connector for recording.

⑨ Tape end output connector

When the cassette tape comes to its end during recording, the alarm device installed externally is activated.

⑩ WARNING/REC output connector

When trouble has occurred in the unit, the alarm device installed externally is activated. Error warning or recording low signal selected on the menu screen 3 is output.

⑪ GND terminal

This terminal is connected to the signal ground terminal of the connected unit in order to reduce noise. It is not connected to ground for safety purposes.

⑫ MIC input jack

Input jack (mini-jack) for an external microphone. This jack has precedence when signals are supplied simultaneously to this jack and the audio input connectors.

⑬ REMOTE control connector

For connecting the AG-A11 remote controller which is available as an optional accessory.

⑭ Battery installation area

Install the battery in this area. See "Lithium Battery" on page 2.

Menu Screens

One of the menu screens appears on the TV monitor when the MENU/REC LOCK switch is set to MENU. The display returns to the regular screen when this switch is set to OFF.

- When a menu screen has appeared, the items are set using the page, shift and set buttons.
- Advance through the pages ("page up") of the menu screen using the page button.
- Move the items (downward or toward the right) using the shift button.
- Change the items (increment or decrement the values) using the set button.

MENU SCREEN 1

[TIME ADJUST]	P1	1
1-01-2000 SAT		2
0:00:00		
[REC LOCK]		
MODE : OFF		3
[HOUR METER]		
00000H		4

MENU SCREEN 2

[DISPLAY]	P2	
POSITION : L-UPPER		5
[REC INDICATE]		
NOT REC : CAMERA		6
[BUZZER]		
ALARM : OFF		
TAPE END : OFF		7
TAPE REMAIN : OFF		
ERR WARN : OFF		

MENU SCREEN 3

[ALARM]	P3	
MODE : OFF		8
DURATION : 30SEC		9
[RECALL]	-	10
-		
-		
[OUTPUT SELECT]		
TERMINAL OUT : ERR WARN		11

MENU SCREEN 4

[REC MODE]	P4	
REC T-MODE : OFF		12
TAPE IN : STOP		13
TAPE END : STOP		14
[VIDEO MODE]		
MODE : AUTO		15
DETAIL : ON		16

MENU SCREEN 5

[INTERNAL TIMER REC]	P5	
[TIMER] START END T-M		17
SUN OFF		
MON OFF		
TUE OFF		
WED OFF		
THU OFF		
FRI OFF		
SAT OFF		
DLY OFF		

MENU SCREEN 6

[DAYLIGHT SAVINGS]	P6	
MODE : OFF		18
[START] [END]		19
WEEK : 1ST-SUN ▶ LST-SUN		20
MONTH : 4 ▶ 10		
TIME : 2:00 ▶ 2:00		
[DIRECT SEARCH]		
MODE : OFF		21

MENU SCREEN 1

In addition to the date and time display and the recording mode lock setting which appear on the TV monitor, the hour meter is displayed on Menu Screen 1.

- 1 Date setting (see page 12)
- 2 Time setting (see page 12)
- 3 Recording mode lock

ON: LOCK on the front display tube flashes up, and all operations except for REC REVIEW are prohibited while recording is in progress.

- 4 Hour meter (see page 5)
This indicates the unit's total operation time (the cumulative total for the cylinder rotation time).

MENU SCREEN 2

The time/date display position, monitor screen blue display and buzzer settings are performed on Menu Screen 2.

- 5 Display position selection (see page 13)
This selects the position where the date and time are to be displayed on the TV monitor.
(L-UPPER ↔ R-UPPER ↔ L-BOTTOM ↔ R-BOTTOM ↔ CENTER ↔ OFF ↔ L-UPPER...)
- 6 Blue display
This sets a blue display on the monitor screen at all times except while recording or playback is in progress.
BLUE: The display on the monitor screen is blue at all times except while recording or playback is in progress.
CAMERA: The pictures from the video input connector are shown on the monitor screen at all times except while playback is in progress.
- 7 Setting of the buzzer sound
ALARM: The buzzer sounds once alarm recording is performed.
TAPE END: When the tape end is reached in the recording mode, the buzzer sounds while the tape is at the end.
TAPE REMAIN: The buzzer sounds when there is only about 3% (with an NV-T120/T160 tape) of the

tape remaining before the end is reached in the recording mode.

ERR WARN: The buzzer sounds when the unit is set to the warning status.

To release the buzzer:

ALARM: Release alarm recording.

TAPE END: Transfer the mode from the tape end or press the STOP button.

TAPE REMAIN: Transfer the mode (but not to PAUSE or REC REVIEW) from the recording mode or press the REC button.

ERR WARN: Release the warning status.

- When TAPE END or TAPE REMAIN has been set to OFF, the buzzer will not sound; however, the REMAIN display will remain lit or flashing.
- When TAPE END or TAPE REMAIN has been set to ON, REMAIN lights or flashes on the display tube at the same time as buzzer sounds.
They cease flashing when the buzzer is released.

Note:

The remaining tape is displayed only with NV-T120 and NV-T160 tapes. It is not displayed when any other tapes are used.

Menu Screens

MENU SCREEN 3

The alarm recording mode and terminal output are set on Menu Screen 3.

8 Alarm recording mode selection (see page 20)

The recording mode in the event of an alarm input is selected. (OFF → ALARM)

ALARM: When there is an alarm input during recording in the time lapse mode, the recording time mode is switched to 8H (alarm recording) and the details of the alarm status are recorded faithfully.

OFF: Alarm recording is not possible even when an alarm signal is input during recording.

9 Alarm recording duration setting

This sets the time elapsing from the start of alarm recording until its end. (30 SEC → 1 MIN → 2 MIN → 3 MIN → 5 MIN → 10 MIN → CONTINUE → MANUAL)

CONTINUE: Alarm recording continues until the tape end.

MANUAL: Alarm recording is performed while the alarm input continues.

10 Alarm recall (see page 20)

This checks the input times (up to 4) of the alarm signals.

11 Terminal connector output signal setting

ERR WARN: When trouble has occurred in the unit (AUTO OFF), the LOW signal is output.

REC: The LOW signal is output during recording.

MENU SCREEN 4

Recording mode and video output are selected on Menu Screen 4.

12 Recording time mode selection

When recording starts, the set time mode is always established. (OFF → 8H → 24H → 40H)

OFF: Any time mode can be set using the TIME MODE button on the front panel. It can be changed even while recording is in progress.

13 Selection of VTR operation when cassette is inserted

STOP: Stop mode

REC: Simply by inserting the cassette tape, recording is started automatically.

REW ► REC: When the cassette is inserted, it is first rewound to the start of the tape and then recording is started automatically.

14 Selection of operation when tape end is detected during recording (see page 18)

STOP: Stop mode

REW: The tape is automatically rewound to the start where it stops.

REPEAT: The tape is automatically rewound to the start, and recording is repeated.

EJECT: The tape is ejected.

15 Video signal mode

This selects the operation of the color/black-and-white automatic selector circuit.

AUTO: The circuit automatically identifies the type of video input or playback signals, and selects the color or black-and-white mode accordingly.

COLOR: The color mode is forcibly established.

B_W: The black-and-white mode is forcibly established.

16 Playback picture quality selection

The outlines of the playback images can be emphasized.

OFF: Regular mode

ON: The playback picture has emphasized outlines.

MENU SCREEN 5

The internal timer recording modes are set on Menu Screen 5.

17 Internal timer recording mode setting (see page 16)

This sets the weekly timer or daily timer recording mode. (OFF/ON)

OFF: Internal timer recording is not set.

ON: Internal timer recording is set. (The start and stop times are set.)

Note:

Internal timer recording does not operate when the date and time have not been set.

MENU SCREEN 6

The daylight savings mode and search dial and jog dial operation mode are set on Menu Screen 6.

18 Selecting the daylight savings mode

Select the daylight savings mode.

ON: The daylight savings mode is selected.

OFF: The daylight savings mode is not selected.

19 Setting the start time for the daylight savings mode

Set the week, month and hour at which the daylight savings mode is to start.

WEEK: Select 1ST, 2ND, 3RD, 4TH or LST (last) and one of SUN through SAT.

MONTH: Select the starting month (1 – 12).

TIME: Select the start time (1:00 – 22:00)*.

20 Setting the end time for the daylight savings mode

Set the week, month and hour at which the daylight savings mode is to end.

WEEK: Select 1ST, 2ND, 3RD, 4TH or LST (last) and one of SUN through SAT.

MONTH: Select the ending month (1 – 12).

TIME: Select the end time (1:00 – 22:00)*.

21 Search dial and jog dial direct operation mode

Set the operation mode when the search dial or jog dial is to be used from another mode.

ON: The dial can be operated directly during STOP and STILL.

OFF: The dial can be operated after the STILL button is pressed.

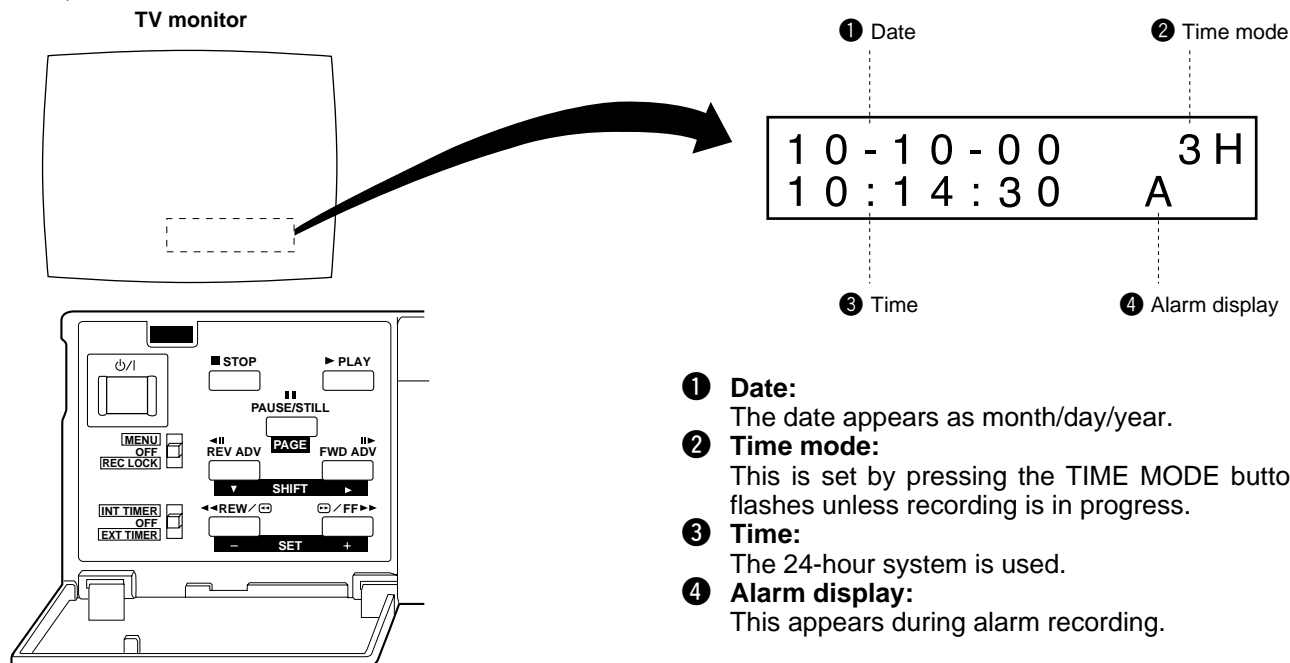
* Minutes are for reference only and cannot be adjusted.

CAUTIONS:

- The menu screens are not displayed while the unit is playing back a tape.
- While the unit is recording, the contents of Menu Screen 1 can be changed; however, Menu Screens 2 to 6 are for reference only and therefore cannot be changed.

Date and Time Settings

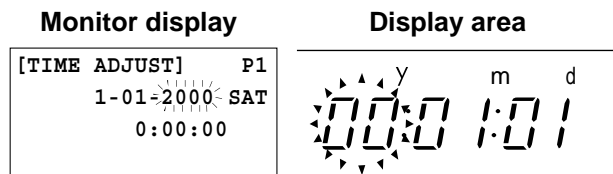
This unit comes with a time/date generator which enables the date and time to be superimposed on the recording. When the power is switched on, the date, time of the day and time mode are displayed (in the case of a regular screen).



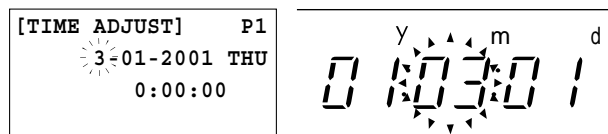
- 1 **Date:**
The date appears as month/day/year.
- 2 **Time mode:**
This is set by pressing the TIME MODE button. It flashes unless recording is in progress.
- 3 **Time:**
The 24-hour system is used.
- 4 **Alarm display:**
This appears during alarm recording.

Example: Setting the date and time to Saturday, March 3, 2001 at 3:25.
The time mode is set to 40 hours.

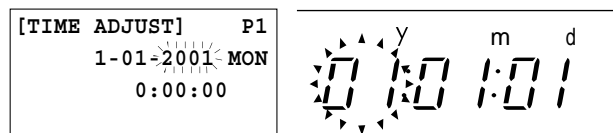
- 1 Set the MENU/REC LOCK switch to MENU. Menu Screen 1 appears, and the year digits flash.



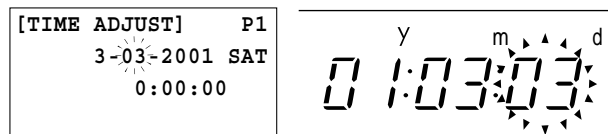
- 3 When the shift (►) button is pressed, the month digits flash.
Press the SET (+, -) buttons to set the month to "3".



- 2 Press the SET (+, -) buttons to set the year to "2001".

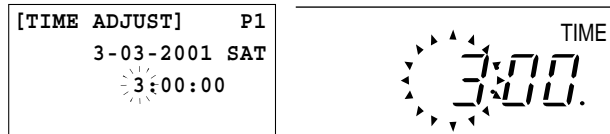


- 4 When the shift (►) button is pressed, the day digits flash.
Press the SET (+, -) buttons to set the day to "03".

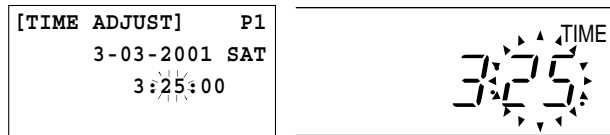


• The year can be set from 2000 to 2079.

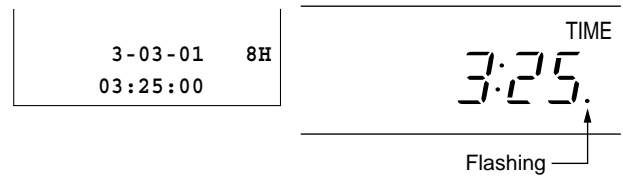
- ⑤ When the shift (▼) button is pressed, the hour digits flash.
Press the SET (+, -) buttons to set the hour to "3".



- ⑥ When the shift (►) button is pressed, minute digits flash.
Press the SET (+, -) buttons to set the minutes to "25".



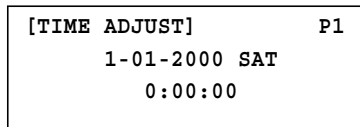
- ⑦ When the MENU/REC LOCK switch is set to OFF, the clock automatically starts running from time and date set.



For the seconds, "00" is set.

Even when the switch is set to MENU, the time will keep advancing if it has not been changed.

- To clear the date and time display, set POSITION under (DISPLAY) on Menu Screen 2 to OFF.
- Even if the power should fail for a period of up to one week, the date, time and other display time mode data are stored in the memory (but only if power has been supplied continuously to the unit for 3 or more days).
When the unit has just been purchased or when it has not been used for along time, the data is not stored in the memory and the display shown below appears.

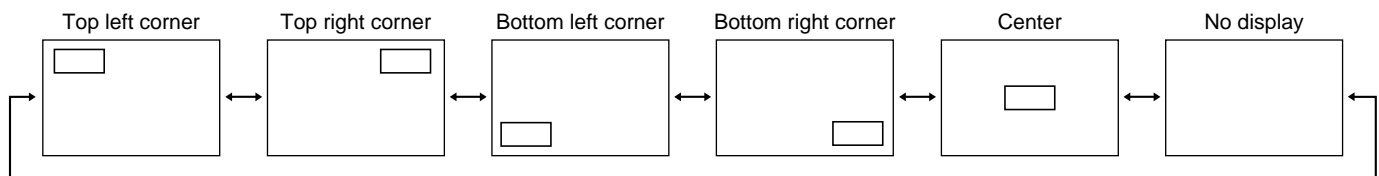


When the time is reset to "0:00:00" as described, check the menu settings. If any of the settings are incorrect, please set them again.

- For the date setting, the unit automatically adjusts for leap years.
- Due to temperature fluctuations and other factors, the clock time may run fast or slow with a monthly error of up to ± 60 seconds. This is not indicative of malfunctioning. Reset the time at regular intervals.

Time/Date Display Position

The position of the date and time displays on the TV monitor changes as shown below when (DISPLAY) on Menu Screen 2 is changed.



- ① Set the MENU/REC LOCK switch to MENU to display to menu screens. Press the page button to display Menu Screen 2 on the TV monitor.

POSITION : ~~L-UPPER~~

- ② Press the set (+, -) buttons to position the display as desired.

POSITION : ~~L-BOTTOM~~

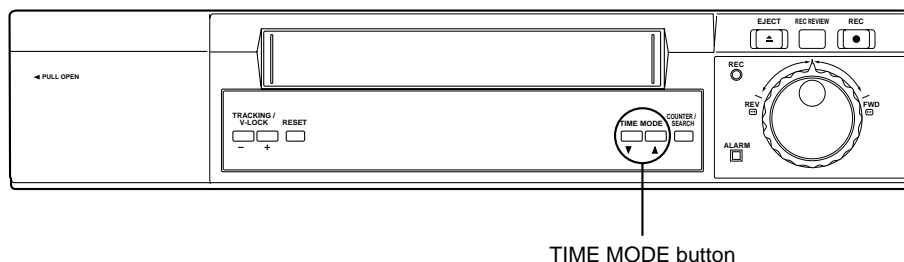
- ③ Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored, and the date and time appear at the selected position.

TIME/DATE display position adjustment function

When the unit is in STOP or EJECT mode, the position of the displayed time/date can be adjusted by pressing the TRACKING (-) or TRACKING (+) button.

- Pressing the TRACKING (-) button moves the position vertically. (Pressing the button 3 times will return the display to its original position.)
- Pressing the TRACKING (+) button moves the position horizontally. (Pressing the button 3 times will return the display to its original position.)
- Pressing the (-) and (+) buttons simultaneously will return the display to its original position (factory setting).

Time Mode Selection



Refer to the table given below to select the mode that suits the intended purpose of use.

Mode \ Tape type	Recordable time (hours)				Video recording interval (sec.)	Sound recording	Camera switching interval (sec.)	Tape travel method
	NV-T160	NV-T120	NV-T90	NV-T60				
8 hours	8	6	4.5	3	1/60	Yes	1/30	Continuous travel at 11.12 mm/sec.
24 hours	24	18	13.5	9	0.05	Yes	0.05	Continuous travel at 3.71 mm/sec.
40 hours	40	30	22.5	15	0.083	Yes	0.083	Continuous travel at 2.22 mm/sec.

Notes on operation

- This unit is designed with the NV-T160 cassette tape as a reference.
- Recording is possible up to 40 hours with this unit when the NV-T160 cassette tape is used.
- Depending on the type of video cassette used, the recordable time will differ.
- Sound can be recorded in all time modes.
- The 24- and 40-hour modes are time lapse modes. Pictures are recorded with frames skipped to enable lengthy recording and playback.
- A tape recorded in a time lapse (24-/40-hour) mode can be played back in quick motion in the 8-hour mode.
- A tape recorded in the 8-hour mode can be played back in slow motion using the time lapse (24-/40-hour) mode.
- A tape recorded in the 2-hour mode on a different VTR can be played back in the 2-hour mode.
- Tapes recorded on this machine cannot be played back other VHS video recorder as they are not compatible.

Selecting the cassette tape

The unit is designed as a product required to exhibit high reliability in surveillance, security, monitoring, etc. In order to maintain its recording reliability, it is recommended that the Panasonic video tapes listed below be used.

<VHS tapes>

- NV-T160
- NV-T120
- NV-T90
- NV-T60
- NV-T30

- Avoid using 180-minute tapes with this unit.

Recording Procedure

- ❶ Switch on the power to the connected equipment.
- ❷ Adjust so that the images of the video cameras appear properly on the TV monitor.
- ❸ Check that the date and time displayed on the TV monitor have been adjusted properly.
- ❹ Insert a cassette tape into the unit after checking that the tab on the cassette is intact.
- ❺ Set the timer recording, auto repeat recording, alarm recording, restoration-of-power-after-failure recording or other recording function.
- ❻ Select the time mode for the recording.
- ❼ Press the REC button.

Notes on operation

- If the PAUSE/STILL button is pressed during recording, the unit is set to the pause mode, and after about 5 minutes in this mode it is transferred to the stop mode.
- Neat frame-to-frame continuity is not achieved if the recording mode is set again after the PAUSE/STILL button is pressed during recording.
- When the MENU/REC LOCK switch has been set to OFF, other operations can be performed during recording.
- When restoration-of-power-after-failure recording is performed, recording can be continued in the same time mode even if the power should fail provided that the power is restored within about one week. (This applies only if the power has been supplied continuously for 3 or more days.)
- When performing auto repeat recording or timer recording, do not neglect to conduct the routine inspections.
- When recording images from a black-and-white camera, set the video signal mode on Menu Screen 4 to B_W.
- Remove the cassette tape if the unit is to be left standing for a prolonged period of time.
- When the power supply is interrupted during recording (with the power switch still ON), a non-recorded portion will be made in the beginning of the tape travel, or the tape will be over-recorded at its ending section. But this is not a malfunction.

Tips For Better Recording

In order to ensure greater reliability in monitoring, surveillance and other continuous operations lasting many hours, this unit comes with some safety functions for recording. Read the following descriptions of these functions before proceeding to operate the unit.

Recording mode lock

There are two ways, as described below, to maintain the recording mode during recording by disabling the operations of the power switch as well as the TIME MODE and operation buttons.

- ❶ Set the MENU/REC LOCK switch to REC LOCK.
- ❷ Set REC LOCK on Menu Screen 1 to ON. (See Note)

The following button and connectors are operational during recording even if the MENU/REC LOCK switch is set to REC LOCK.

- Alarm input connector, alarm reset connector
- REC REVIEW

Recording check

When the REC CHECK button is pressed during recording, the tape runs temporarily in the reverse direction, and the recorded section is played back. This function can be used to check the daily operation of the equipment in the system.

Restoration-of-power-after-failure recording

When a power failure has occurred during recording, the unit automatically starts recording if the power is restored within approximately one week.

- When the power fails, the tape “losing” safety protection function is activated to protect the video heads and video tape.

Before power is restored	After power is restored
• Stop, play, fast forward	Stop mode is established.
• Recording	Recording mode is established.
• Auto rewind • Auto rewind during auto repeat recording	Unit is returned to the mode applying before the power failed.

Notes:

- When the power cord has come out of the socket or a power failure has occurred, no operations will be acknowledged for about 30 seconds after the power has been restored: this is to protect the tape.
- Once the recording mode is established, recording cannot be released until REC LOCK on Menu Screen 1 is set OFF.

Timer Recording

There are two methods of timer recording: one uses the internal timer and the other uses an external timer.

Internal timer recording

Start time and stop time

Bear in mind the following points when setting these times.

- **When the stop time is set later than the start time:**
Recording will commence at the start time on the day concerned and stop at the end time on the same day.
Example: 8:30 → 17:00
- **When the start time is set later than the stop time or the start time and stop time for weekly recording (weekly timer) are the same:**
Recording starts at the start time on the day concerned and ends at the stop time on the following day.
Example: 17:00 → 8:30
- **When the start time and stop time are the same (for weekly recording):**
Recording starts at 8:30 on the day concerned and ends at 8:30 on the following day.
Example: 8:30 → 8:30

To record for an entire day, set the start time and stop time to 0:00.

- Weekly recording (weekly timer) can be set by the day of the week.
- When (INTERNAL TIMER REC) on Menu Screen 5 is set to OFF for both the weekly timer and daily recording (daily timer), nothing appears for the start or stop time. Timer recording is considered not to be set.

Internal timer recording operation

- 1 Check that a video cassette with its tab intact has been inserted.
- 2 Check that the TV monitor shows the correct present time.
- 3 Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button so that the INTERNAL TIMER REC timer setting screen appears on the TV monitor.

```
[INTERNAL TIMER REC]  P5

[TIMER] START  END   T-M
SUN OFF
MON OFF
TUE OFF
WED OFF
THU OFF
FRI OFF
SAT OFF
DLY OFF
```

VTR operations after the settings

- The unit's power is turned off, and even if other buttons are pressed, their operations are not accepted.
- When the start time and stop time have not been set, INT flashes on the display.

Releasing the internal timer mode

Set the TIMER MODE switch to OFF to clear INT on the display.

Note:

- Since it takes some moments for recording to start, set the start time for timer recording one minute earlier.

- 4 Set the operation times of the internal timer.
 - For details on the settings, refer to the sections on "Daily timer" or "Weekly timer." (See page 17.)
- 5 Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.
- 6 Set the TIMER MODE switch to INT TIMER so that INT lights on the display.

When the time and date for Menu Screen 1 have not been set, a cassette has not been inserted, the timer has not been set, or when a cassette with a broken out tab has been inserted, the buzzer sounds and INT flashes on the display.

Daily Recording (Daily Timer)/Weekly Recording (Weekly Timer)

Example: When recording from 8:30 to 12:00 from Sunday through Thursday and from 9:00 to 12:00 on Fridays and Saturdays

- 1 Check that OFF or ON for Sunday (SUN) is flashing. If the setting is OFF, press the set (+, -) buttons to display ON.

[INTERNAL TIMER REC] P5			
[TIMER] START	END	T-M	
SUN OFF			
MON OFF			

- 2 When the shift (▶) button is pressed, the setting moves to the start time and the “hour” digits flash.

SUN ON 0:00▶ 0:00

- 3 Press the set (+, -) buttons to display “8.”

SUN ON 8:00▶ 0:00

- 4 When the shift (▶) button is pressed, the “minutes” digits flash.

SUN ON 8:00▶ 0:00

- 5 Press the set (+, -) buttons to display “30”.

SUN ON 8:30▶ 0:00

- 6 When the shift (▶) button is pressed, the “hour” digits flash.

SUN ON 8:30▶ 0:00

- 7 Press the set (+, -) buttons to display “12”.

SUN ON 8:30▶ 12:00

- 8 When the shift (▶) button is pressed, the “minutes” digits flash.

SUN ON 8:30▶ 12:00

- 9 Press the set (+, -) buttons to display “00”.

SUN ON 8:30▶ 12:00

- 10 Press the shift (▶) button to set the recording time mode. When the shift (▼) button is pressed, the MON is flashing.

SUN ON 8:30▶ 12:00 24

- 11 Following the same procedure in steps 1 to 10, display the start time of “8:30” and stop time of “12:00” from Monday (MON) through Thursday (THU). Following the above procedure, set the times for Friday (FRI) and Saturday (SAT) as well. In this way, the timer operation times have been set for each day of the week. The settings for daily recording (daily timer) are also performed following the same steps 1 to 10 .

- The setting shown on the screen at the left translates into the weekly and daily timer recording combinations shown below which, in turn, means that the actual recording time on the tape is shown at the bottom.

[INTERNAL TIMER REC] P5										
[TIMER] START	END	T-M		Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
SUN ON 8:30	8:00	24		24H	24H			12H		24H
MON ON 12:00	14:00	12		8:00 8:30	8:00 12:00			14:00 23:00		12:00
TUE OFF										
WED OFF										
THU ON 14:00	23:00	12								
FRI OFF										
SAT ON 12:00	8:00	24								
DLY ON 18:00	8:00	12								

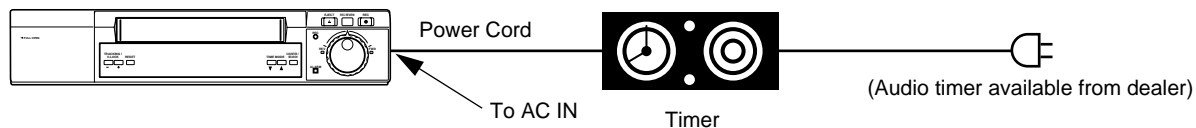
Weekly Timer	8:00	8:30	8:00	12:00				14:00	23:00	12:00
	12H	12H	12H	12H				12H	12H	24H
	8:00	18:00	8:00	12:00				14:00	8:00	18:00
Daily Timer	8:00	8:30	8:00	12:00	12:00	18:00	8:00	18:00	8:00	14:00
	12H	12H	12H	12H	12H	12H	12H	12H	12H	12H
	8:00	8:30	8:00	12:00	12:00	18:00	8:00	18:00	8:00	14:00
Actual Recording Time	8:00	8:30	8:00	12:00	12:00	18:00	8:00	18:00	8:00	14:00
	12H	12H	12H	12H	12H	12H	12H	12H	12H	12H
	8:00	8:30	8:00	12:00	12:00	18:00	8:00	18:00	8:00	14:00

- The day of the week time settings are displayed, enabling the settings to be checked for each day of the week.
- Proceed with the setting with due consideration given to the total recording time since a 160-minute tape is long enough to provide recording for up to 40 hours only.

Timer Recording

External Timer Recording

The unit can be made to record using an external timer to turn on its power.



External timer recording operations

- ❶ Check that a video cassette with its tab intact has been inserted.
 - ❷ Set the TIMER MODE switch to EXT TIMER so that EXT lights on the display. At the set time, power is supplied from the external timer and the unit is set to the recording mode.
- If the video cassette tape has not been inserted or if its accidental erasure prevention tab has been broken, EXT will flash on the display, and external timer recording cannot be conducted.
 - Since it takes some moments for recording to start, set the start time for timer recording one minute earlier.
 - Depending on the tape position, some of the images at the start of the external timer recording may not be recorded or may record over the images at the end of the previous external timer recording.

Auto Repeat Recording/Auto Rewinding

Auto repeat recording: This function automatically rewinds the cassette tape when its end is detected in the recording mode, and it repeats recording from the start of the tape.

Auto rewinding: This function automatically rewinds the tape to the start when the tape end is detected in the recording mode.

- ❶ Check that a video cassette with its tab intact has been inserted.
- ❷ Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display Menu Screen 4 on the TV monitor.
- ❸ Press the shift (▼) button to move the flashing to TAPE END.
Press the set (+ or –) button to display REPEAT for auto repeat recording or REW for auto rewinding.
- ❹ “R” lights on the display.
 - If auto rewinding has been selected, “R” is cleared.
- ❺ Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.

```
[REC MODE] P4
REC T-MODE : OFF
TAPE IN : STOP
TAPE END : STOP

[VIDEO MODE]
MODE : AUTO
DETAIL : ON
```

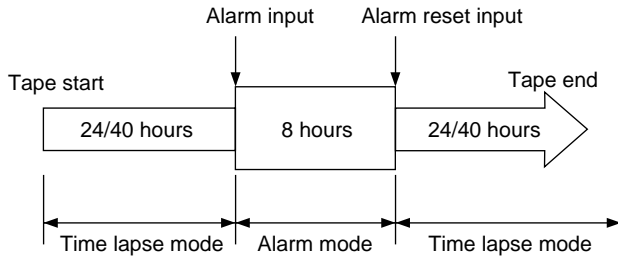
Notes of operation

- When auto repeat recording is to be performed, do not neglect the routine inspections. Since the image deteriorates when the same tape is used over and over again for auto repeat recording, replace the tape with a new one after about 50 recordings. When the tape is removed and then reinserted, the number changes to 01.
- Alarm signals are not accepted during auto rewinding, and so alarm recording is not performed.
- If an alarm signal is supplied during auto repeat recording, the alarm recording mode is established. If the tape then reaches its end, auto repeat recording is performed but alarm recording is released.
- If TAPE END on Menu Screen 4 has been set to REPEAT, use a DURATION other than MANUAL.
- When the power cord has come out of the socket or a power failure has occurred, no operations will be acknowledged for about 30 seconds after the power has been restored: this is to protect the tape.

Alarm Recording (Emergency Recording)

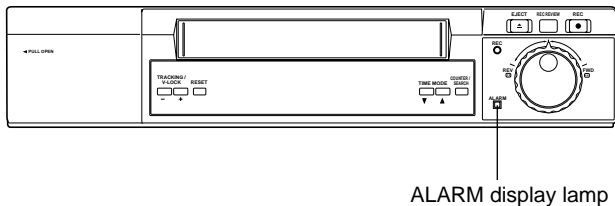
When an emergency occurs at the monitoring site during prolonged monitoring and recording, the alarm function is automatically triggered, and alarm recording is performed.

Principle of alarm recording

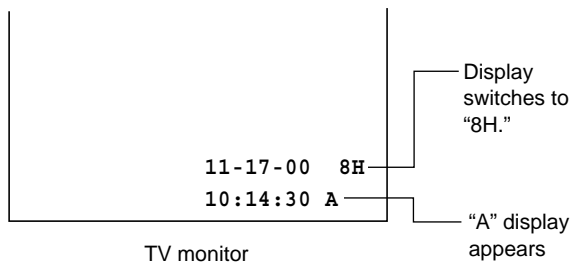
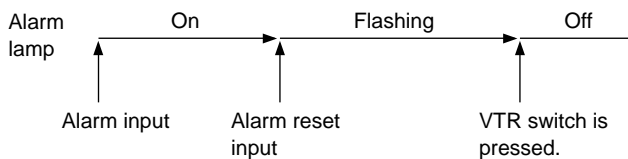


- When an alarm signal is supplied by an alarm sensor (door or intercom switch, etc.) during recording in a time lapse mode, the recording speed is switched to the 8-hour mode and the details of the state of emergency are faithfully recorded.

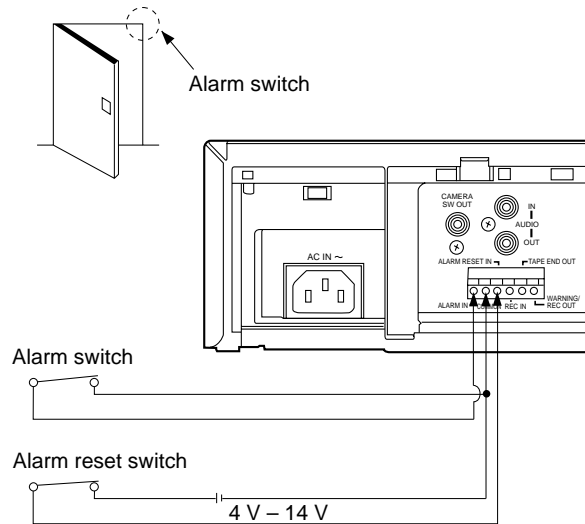
Alarm and display methods during alarm recording



- When an alarm signal is supplied, the alarm display lamp functions as follows.



Connecting the alarm input connector



- Alarm recording starts when the alarm switch is set on. When the alarm reset switch is set ON after recording has started, alarm recording is released and operation is returned to the original time lapse recording mode.
- Alarm recording can be released by pressing the STOP button during alarm recording. However, it cannot be released even by pressing the STOP button if the MENU/REC LOCK switch is at REC LOCK or INT is lighted on the display.
- Alarm recording can be automatically reset without supplying the alarm reset input signal. The reset time can be set for 0.5, 1, 2, 3, 5 or 10 minutes.
- Another option is alarm recording only while the alarm input signal is supplied.
- Alarm recording is also possible as far as the end of the tape.
- When the alarm mode is OFF, alarm recording is not possible even if the alarm switch is set to ON.

Alarm Recording (Emergency Recording)

Alarm Recording Operation

- 1 Check that a video cassette with its tab intact has been inserted.
- 2 Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display the alarm recording setting screen (Menu Screen 3) on the TV monitor.

```
[ALARM] P3
      MODE : OFF
      DURATION : 30SEC

[RECALL] -
          -
          -
```

- 3 Press the set (+ or -) button to display ALARM for MODE.

```
MODE : ALARM
```

- If TAPE END on Menu Screen 4 has been set to REPEAT, the auto repeat recording mode is established when the tape comes to the end. When auto repeat recording is to be performed, use an alarm recording interval setting other than MANUAL.
- With emergency recording, set the unit to the POWER OFF or STOP mode.

- 4 Press the shift (▼) button to move the flashing to DURATION. Press the set (+ or -) button to set the recording duration.

```
DURATION : 30SEC
```

- 5 Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.
- 6 Press the REC button. If an alarm input signal is subsequently supplied, the time mode set to 8H, and alarm recording continues until the alarm is released.

Alarm Recall

The time when the alarm signal was input can be ascertained on the TV monitor by checking the alarm input time in the RECALL item on Menu Screen 3.

- 1 Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display the alarm recording setting screen (Menu Screen 3) on the TV monitor.
- 2 Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.

```
[ALARM] P3
      MODE : ALARM
      DURATION : 30SEC

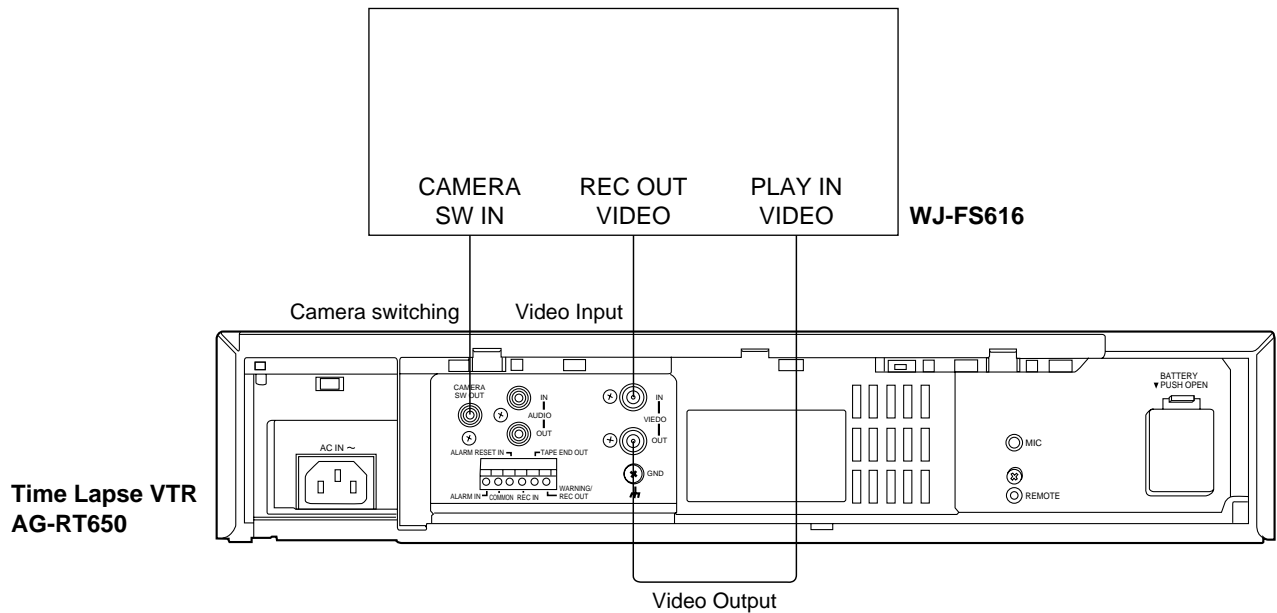
[RECALL] 10-10-01 20:19
          9-14-01 12:05
          8-30-01 08:40
          6-25-01 04:14

[OUTPUT SELECT]
      TERMINAL OUT : ERR WARN
```

- The alarm recall function stores up to 4 alarm input times in the memory and displays them on the screen. If there have been more than 4 inputs, they will be deleted from the screen in sequence starting with the oldest data.
- When the RESET button is pressed while Menu Screen 3 is on the display, the alarm recall memory can be cleared.

Frame Switcher Connection and Recording

Connections (using the WJ-FS616)



- Do not supply signals from color cameras and black-and-white cameras simultaneously to the camera input connectors since this may disturb the synchronization on the monitor screen or generate noise.
- During playback, turn the Quasi-V insertion to ON or OFF with the FWD ADV button. This enables the appearance of the pictures of other cameras to be reduced.

Playback Procedure

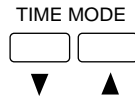
Before operating the unit, check that the internal/external timer recording displays (INT/EXT) have been cleared from the display. (If INT or EXT is displayed, use the TIMER MODE switch to clear it.)

- 1 Switch on the power to the unit and TV monitor.
- 4 Press the PLAY button.

- 2 Insert the recorded cassette tape into the unit.



- 3 Select the time mode.

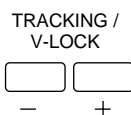


Notes on operation

1. Bear in mind the following points when playing back parts of a tape recorded in a time lapse (24-/40-hour) mode.
 - When the tape is played back in the same mode, noise resembling dropouts will appear on the screen: this is not indicative of malfunctioning.
 - The picture may oscillate in the vertical direction: this is not indicative of malfunctioning.
 - When a tape is played back in the same time mode, the picture may shake slightly sideways: this is not indicative of malfunctioning.
 - Turn Quasi-V insertion ON (□▷) or OFF (▷) with the FWD ADV button. Dancing can be minimized when a tape is played back in a time lapse (24-/40-hour) mode. Moreover, playing back a tape in a system featuring a frame switcher enables the appearance of the pictures of other cameras to be reduced.
2. Bear in mind the following points when playing back parts of a tape recorded in a VHS mode (8 hours).
 - When a tape is played back in a time lapse mode, slight noise may appear at the top and bottom of the screen: this is not indicative of malfunctioning.
3. When noise has occurred during still-picture playback, press the FWD ADV button to play it out. (It may not always be possible to play out the noise.)
4. Bear in mind that if the power cable is disconnected and then re-connected or if the power has been restored after it has failed when the tape was played with EXT indicated on the display by the TIMER MODE button, the unit will automatically be set from playback to the recording mode.
5. When the PAUSE/STILL button is pressed during playback, the unit is set to the pause mode, and a still picture PLAY button. If the unit is kept in the pause mode for more than 5 minutes, it will be set to the stop mode.
6. If the horizontal AFC on the TV monitor is too long or when a video camera with random interlace scanning has been used, the top area of the TV monitor may be distorted: this is not indicative of malfunctioning.
7. A tape recorded in the 2-hour mode on a different deck can be played back in the 2-hour mode. However, it cannot be played back in 24- or 40-hour mode.
 - "8H" appears when a tape is played back which was recorded for 6 hours using another VTR.
8. Tapes recorded on this machine cannot be played back other VHS video recorder as they are not compatible.
9. When the power cord has come out of the socket or a power failure has occurred during fast forwarding or rewinding, no operations will be acknowledged for about 30 seconds after the power has been restored: this is to protect the tape.

Tracking

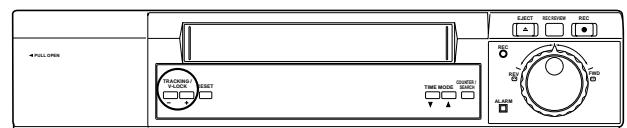
When noise such as that shown below appears on the playback image in the 8-hour time mode, press the tracking (+ or -) button to minimize the noise.



- For the tracking default setting, press the "+" and "-" buttons together (in the 8-hour time mode only).
- In the 24- or 40-hour mode, press the "+" or "-" button to adjust the tracking.

Vertical hold adjustment

If the image shakes slightly in the vertical direction during still-picture playback, press the V-LOCK buttons (-, +) to reduce the dancing.




- If the TV monitor has a vertical hold control, adjust that control also.

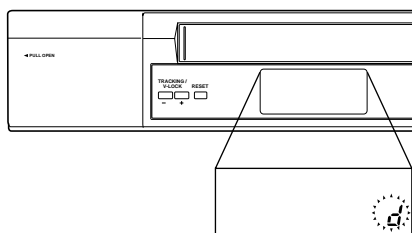
Troubleshooting

Trouble with installation


- | | |
|---------------------|---|
| No power. | • Is the power plug inserted properly into the AC outlet? |
| No picture. | • Is the unit connected properly with the TV, video cameras, etc.?
• Are any of the connecting cables making faulty contact? |
| Indistinct picture. | • Has the focus on the video cameras been adjusted correctly? |

Trouble with functions or operation

- | | |
|---|---|
| Nothing happens even when operation buttons are pressed. | • Is the video cassette loaded?
• Is the MENU/REC LOCK switch at OFF?
• Has the video cassette been inserted properly? Press the EJECT button to eject the cassette and insert properly.
• Has INT lighted on the display? |
| "  mark is flashing. | • The unit will not operate because its safety protection function has been triggered. Wait until the flashing disappears. |




In case of moisture detection:

The " mark at display section flashes.



Ejection will remain incomplete when a video cassette has been inserted.



Wait until the " mark goes out with VTR switch turned "ON". It may take a few hours, although it depends upon conditions.

- | | |
|---|---|
| Date and time display data has not been stored in memory when the power failed. | • Has the unit's power plug been disconnected from the power outlet for a long time?
Insert the unit's power plug into the power outlet and supply power continuously for at least 3 days to the unit. |
|---|---|

Trouble with recording

- | | |
|---|--|
| Tape can be played, fast forwarded or rewind but not recording results. | • Is the tab on the video cassette broken? |
| Recording has stopped. | • Is the video cassette tape at its end?
• Have more than 5 minutes elapsed since the PAUSE/STILL button was pressed during recording?
• Are the routine inspections being carried out? If this phenomenon keeps recurring, it means that some failure or other is to blame. Consult with your dealer. |

Troubleshooting

The power has been restored after a power failure but recording does not automatically resume.	<ul style="list-style-type: none"> • Has the power failure lasted a long time (more than 1 week)? Set the timer recording switch to EXT to ensure that the unit is set to the recording mode even after a prolonged power failure.
Recording cannot be stopped.	<ul style="list-style-type: none"> • First set the MENU/REC LOCK switch to OFF and then operate. • Is REC LOCK on Menu Screen 1 at OFF?
1-week programmed timer recording cannot be conducted properly.	<ul style="list-style-type: none"> • Are the date and time on the regular displays correct? (See page 12)
One or more cameras do not record when a multiple number of cameras are used.	<ul style="list-style-type: none"> • Turn the time adjustment control on the sequential switcher, and adjust it to a setting which is longer than the video recording duration in the recording time mode. • Connect a camera switching cable between the unit and sequential switcher. (See page 21)
No auto repeat recording.	<ul style="list-style-type: none"> • Has the stop button been pressed during auto rewinding?
No timer recording.	<ul style="list-style-type: none"> • Are the present time and start/stop times for the timer recording correct? • Has INT or EXT lighted on the display?
No alarm recording.	<ul style="list-style-type: none"> • Have the alarm sensors and alarm input connectors been connected properly? • Has the alarm recording mode been selected on Menu Screen 3?

Trouble with playback

Noise sometimes appears on the playback pictures.	<ul style="list-style-type: none"> • Adjust the tracking buttons. (See page 22)
Dirty playback picture.	<ul style="list-style-type: none"> • The video heads may be dirty or clogged or they may have reached the end of their service life. Consult with your dealer.
"Snow" on playback picture.	<ul style="list-style-type: none"> • The video heads may be dirty or clogged. Consult with your dealer.
While a multiple number of cameras are being used, two scenes appear as the playback picture when the cameras are switched.	<ul style="list-style-type: none"> • Has the camera switching signal cable been connected properly?
Recording starts when the unit's power plug is connected to or disconnected from the power outlet.	<ul style="list-style-type: none"> • Has INT or EXT lighted on the display?
No playback because recording starts when the main power for the connected equipment is set to ON.	<ul style="list-style-type: none"> • Has INT or EXT lighted on the display?

Specifications

Power Source: 120 V AC, 50 – 60 Hz
Power Consumption: 20W

Video Recording

System: 4 rotary heads, helical scanning
Tape Speed: 11.12 mm/s (8-hour mode)
 3.71 mm/s (24-hour mode)
 2.22 mm/s (40-hour mode)
Tape Format: Tape width 12.7 mm (1/2 inch),
 VHS tape
Recording Time: 8 hours (with NV-T160, 8H mode)
FF/REW Time: Less than 2.5 min. (with NV-T160)

VIDEO

Television System: EIA Standard (525 lines, 60 fields)
 NTSC color signal
Modulation System: Luminance; Frequency modulation
 recording
 Color Signal; Converted subcarrier
 phase shift recording
Input: Video Input (BNC); 1.0 Vp-p,
 75 ohms, unbalanced
Output: Video Output (BNC); 1.0 Vp-p,
 75 ohms, unbalanced
Horizontal Resolution: Color; More than 300 lines
 B/W; More than 300 lines
S/N: B/W; Better than 45 dB (8-hour mode,
 DETAIL OFF)
 Color; Better than 43 dB (8-hour mode,
 DETAIL OFF)

AUDIO

Input: Audio Input (Phono);
 –10 dBV, 47 kohms, unbalanced
 Mic (Mini-jack);
 –60 dBV, 600 ohms, unbalanced
Output: Audio Output (Phono);
 –8 dBV, 1 kohm, unbalanced
Tracks: 1 track (Normal)

Recording/Playback Time

Modes: 8/24/40 hours mode


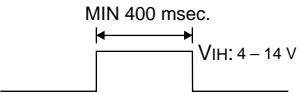
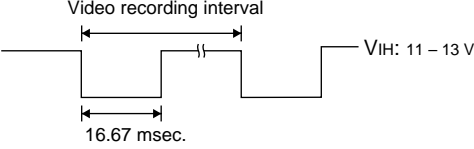
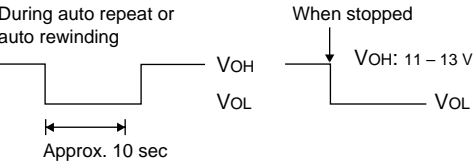
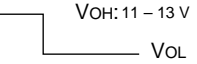
CONNECTORS

Alarm Input/REC IN: Contact closure
Alarm Reset Input: +4 V – +14 V

Operating Temperature: 41°F – 104°F (5°C – 40°C)
Operating Humidity: 35% – 80%
Weight: 8.36 lbs (3.8 kg)
Dimensions: 16-15/16"(W) × 3-1/2"(H) × 11-9/16"(D)
 430 × 88 × 293.5 mm

Weight and dimensions shown are approximate.
 Specifications are subject to change without notice.

Input/Output Terminal Signal Level

Terminal	Signal Level	Note
Alarm Input/REC IN		LOW Input
Alarm Reset Input		HIGH Input
Camera Switching Output		VOH = 11 – 13 V (5.6 kΩ) VOL = 0 – 0.6 V (max. 3 mA)
Tape end output		VOH = 11 – 13 V (4.7 kΩ) VOL = 0 – 0.6 V (max. 3 mA)
Warning output		VOH = 11 – 13 V (4.7 kΩ) VOL = 0 – 0.6 V (max. 3 mA)

Panasonic

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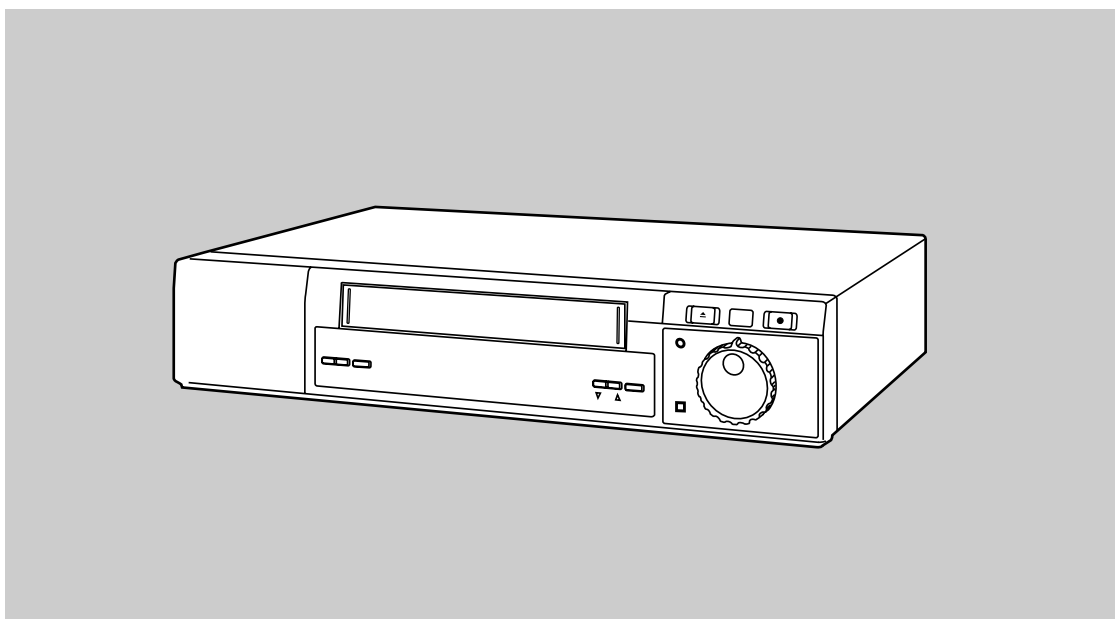
Division of Matsushita Electric of Puerto Rico Inc.

San Gabriel Industrial Park, 65th Infantry Ave., Km. 9.5, Carolina, Puerto Rico 00630 (787) 750-4300

Manuel d'instructions

Magnétoscope à temps échelonné

Modèle AG-**RT650**_P



Panasonic®

Il est recommandé de lire attentivement ce manuel avant d'utiliser l'appareil.

Mise en garde:

“L'enregistrement non autorisé d'émissions de télévision, films, rubans magnétoscopiques ou autres, protégés par des droits d'auteur, peut enfreindre les droits de propriété et aller à l'encontre des dispositions de la loi sur les droits d'auteur”.



Le symbole de l'éclair dans un triangle équilatéral indique la présence d'une tension suffisamment élevée pour engendrer un risque de chocs électriques.



Le point d'exclamation dans un triangle équilatéral indique que le manuel d'instructions inclus avec l'appareil contient d'importantes recommandations quant au fonctionnement et à l'entretien de ce dernier.

ATTENTION:

AFIN DE PRÉVENIR TOUT RISQUE D'INCENDIE, DE CHOCS ÉLECTRIQUES OU D'INTERFÉRENCES, N'UTILISER QUE LES ACCESSOIRES RECOMMANDÉS.

MISE EN GARDE:

AFIN DE PRÉVENIR TOUT RISQUE D'INCENDIE OU DE CHOCS ÉLECTRIQUES, ÉVITER D'EXPOSER CET APPAREIL À LA PLUIE OU À UNE HUMIDITÉ EXCESSIVE.

ATTENTION:

L'interférence radioélectrique générée par cet appareil numérique de type A ne dépasse pas les limites énoncées dans le Règlement sur les perturbations radioélectriques, section appareil numérique, du Ministère des Communications.

Pile au lithium

Remplacer la pile exclusivement par une pile N° VL2330/1HF.

Le fait d'utiliser un autre type de pile pourrait poser un risque de feu ou d'explosion.

Attention—La pile risque d'exploser si elle n'est pas manipulée avec soin. Ne pas la recharger, la démonter ni la jeter au feu.

 sont les consignes de sécurité.

- Ne pas insérer les doigts ni d'objets dans le compartiment de la cassette vidéo.
- Éviter de placer et de faire fonctionner l'appareil à proximité d'un champ magnétique. Éviter particulièrement les haut-parleurs de grand format.
- Éviter l'exposition à des températures ou à des taux d'humidité extrêmes afin de prévenir les dommages à l'appareil ou au ruban.
- Ne jamais vaporiser de produits nettoyants ni de cire directement sur le coffret.
- Si l'appareil n'est pas utilisé durant une période prolongée, le protéger contre la poussière et la saleté.
- Ne pas laisser de cassette dans l'appareil s'il n'est pas utilisé.
- Ne pas obstruer les événements d'aération de l'appareil.

- Placer l'appareil en position horizontale et ne rien déposer sur le dessus.
- La cassette vidéo ne peut enregistrer que dans un seul sens, d'un seul côté. Il n'est pas possible d'effectuer un enregistrement dans les deux sens ni sur deux pistes.
- La cassette vidéo peut servir à des enregistrements couleur ou monochrome.
- Ne pas démonter l'appareil. Aucune pièce interne ne peut être réparée par l'utilisateur.
- Si du liquide quelconque s'infiltre dans l'appareil, le faire vérifier immédiatement.
- Confier l'entretien à un technicien qualifié

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Caractéristiques

Enregistrement et lecture en modes 24 heures et 40 heures avec une cassette NV-T160

En plus du mode 8 heures, l'enregistrement et la lecture sont possibles en mode de temps échelonné (modes 24 heures et 40 heures).

Arrêts sur image à excellente définition

La lecture dans les modes couleur et monochrome produira des arrêts sur image plus nettement définis grâce à une résolution horizontale plus de 300 lignes.

Choix complet de fonctions d'enregistrement

Parmi le vaste choix de fonctions d'enregistrement, citons l'enregistrement avec reprise d'enregistrement après rétablissement de l'alimentation suite à une panne, l'enregistrement quotidien ou par jour de la semaine via la minuterie interne, l'enregistrement programmé via une minuterie externe, l'enregistrement déclenché sur signal d'alarme, l'enregistrement d'urgence et la reprise automatique d'enregistrement.

Fonctions de lecture

Parmi les fonctions de lecture pratiques, citons la fonction de révision d'enregistrement, qui permet un visionnement immédiat des images enregistrées, la fonction de recherche, pratique, qui permet de localiser les images promptement, et les fonctions d'avance/recul image par image et d'arrêt sur image, qui permettent un visionnement attentif de scènes particulières.

Affichage de comptage des reprises d'enregistrement

Il est possible d'indiquer sur l'affichage du compteur le nombre de fois qu'un enregistrement doit être repris.

Repérage progressif/repérage proportionnel

L'appareil incorpore une fonction repérage progressif ou repérage proportionnel qui permet de repérer rapidement les sections de lecture.

Fonction de pistage automatique

Une pression simultanée sur les touches pistage "—" et "+" permettra de régler automatiquement le pistage.

Générateur horodateur incorporé

L'appareil incorpore un microprocesseur avec fonction de calendrier qui permet d'afficher l'heure au registre ou sur l'écran témoin et de piloter les données relatives à l'heure de la minuterie interne.

Fonction de verrouillage du mode enregistrement

Afin de prévenir toutes les erreurs de fonctionnement qui pourraient se produire pendant l'enregistrement, l'appareil est doté d'une fonction de double verrouillage du mode enregistrement.

Raccordement à un commutateur cyclique

L'appareil pourra être raccordé en toute facilité à un commutateur cyclique une fois qu'il aura été raccordé aux prises d'entrée vidéo et de commutation de caméra.

Horodateur

L'appareil incorpore un horodateur qui fournit des informations utiles pour l'entretien et les vérifications.

Télécommande

L'appareil pourra être commandé à une distance d'environ 5 mètres si la télécommande AG-A11, vendue séparément, est raccordée.

Recommandation pour les opérations d'entretien courantes

Bien que l'appareil ait été conçu pour supporter de longues heures de fonctionnement sans problème, les points ci-dessous devront être vérifiés régulièrement pour que l'appareil se maintienne en parfait état de marche. Utiliser l'horodateur pour savoir quand effectuer les inspections.

Un magnétoscope est un appareil de précision, et à ce titre il est recommandé que l'utilisateur possède un contrat de maintenance et d'inspection qui permettra de garantir un fonctionnement sans ennuis et sans pannes. Pour de plus amples détails, consulter son détaillant.

Temps d'utilisation cumulé (en heures)	500	1000	1500	2000	2500	3000	3500	4000	8000	12000
Point d'inspection										
Nettoyage du système de défilement	●	●	●	●	●	●	●	●	●	●
Têtes audio	●	●	●	●	●	●	●	●	●	◎
Têtes vidéo	●	●	●	●	●	●	●	◎	◎	◎
Cylindre des têtes	●	●	●	●	●	●	●	●	●	◎

◎ Inspection d'usure

● Nettoyage

(Utilisation en mode 24 heures/40 heures)

Le tableau ci-dessus ne vise qu'à donner des directives d'ordre général pour l'inspection des pièces principales intervenant dans les vérifications périodiques. La fréquence des inspections sera déterminée en fonction de l'environnement dans lequel le magnétoscope est utilisé.

Vérifications périodiques et opérations d'entretien courantes

L'appareil est conçu pour supporter de longues heures de fonctionnement sans problème. Toutefois, il est recommandé de procéder à un certain nombre de vérifications périodiques pour garantir un parfait état de marche.

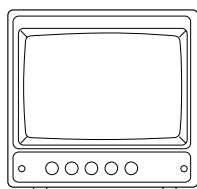
Précautions

Ne pas oublier d'effectuer les vérifications périodiques lors d'une reprise automatique d'enregistrement.

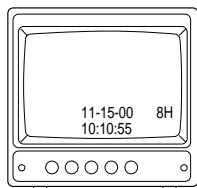
Vérifications périodiques

- ❶ Placer l'interrupteur de l'appareil, des caméras vidéo, de l'écran témoin et des autres appareils du système de surveillance à la position ON.

- ❷ L'image de l'écran témoin est-elle satisfaisante?



- ❸ La date et l'heure affichées à l'écran témoin sont-elles exactes?



- ❹ Rebobiner la cassette, enregistrée la veille, sur une longueur équivalente à un comptage du compteur à plusieurs chiffres.



- ❺ Appuyer sur la touche mode de temps (TIME MODE) pour régler le mode 8H (8 heures).



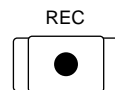
- ❻ Appuyer sur la touche lecture (PLAY). Le ruban est lu sur une longueur équivalente à un comptage du compteur à plusieurs chiffres.



- ❼ L'image de lecture est-elle satisfaisante?

- ❽ Y a-t-il des problèmes avec la date et l'heure enregistrées?

- ❾ Appuyer sur la touche enregistrement (REC).



- ❿ Vérifier les images de lecture enregistrées en mode de temps 8 heures.

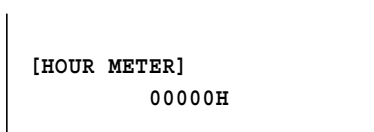
- ⓫ Lorsque toutes les vérifications ont été effectuées, commuter l'appareil sur le mode voulu.

Opérations à effectuer après les vérifications périodiques

Dans le cas peu probable où l'on rencontrerait un problème, couper le contact, débrancher le fil d'alimentation de la prise secteur en le tenant par sa fiche, et consulter le détaillant auquel l'appareil a été acheté.

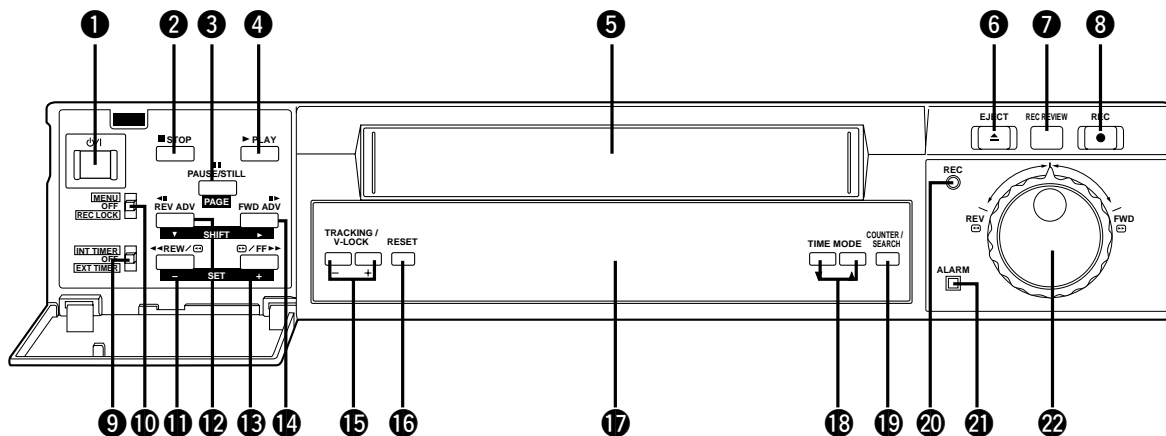
Vérifications périodiques recommandées

L'appareil possède un horodateur qui indique le nombre d'heures que le magnétoscope a fonctionné. Lorsque le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) est mis à la position MENU, le menu 1 apparaît à l'écran témoin et il est ainsi possible de vérifier l'horodateur. L'horodateur fournira une indication approximative pour les intervalles de nettoyage ou de remplacement des pièces internes. Pour de plus amples détails, consulter son détaillant.



Ecran témoin

Les commandes et leurs fonctions



- 1 Interrupteur (POWER)/voyant de contact**
Le contact est établi par pression sur cet interrupteur. A la nouvelle pression sur l'interrupteur, le contact se coupe.
- 2 Touche arrêt (STOP)**
Quand une pression est exercée sur cette touche, le ruban cesse de défiler.
- 3 Touche pause/arrêt sur image (page) (PAUSE/STILL)**
Quand une pression est exercée sur cette touche pendant un enregistrement, le ruban cesse provisoirement de défiler. Si la pression est exercée pendant la lecture, le ruban cesse provisoirement de défiler et un arrêt sur image apparaît à l'écran témoin. Si une pression est exercée à nouveau, le défilement du ruban reprend. Si la pression est exercée pendant qu'un menu est affiché, les pages du menu avancent.
- 4 Touche lecture (PLAY)**
La lecture commence quand une pression est exercée sur cette touche.
- 5 Compartiment de cassette**
C'est la fente de chargement de la cassette vidéo.
- 6 Touche éjection (EJECT)**
Elle permet d'éjecter la cassette vidéo.
- 7 Touche revue d'enregistrement (REC REVIEW)**
Si la pression est exercée pendant un enregistrement, le ruban défile provisoirement en sens arrière, et lorsque la section enregistrée a été lue, l'appareil revient au mode enregistrement.
- 8 Touche enregistrement (REC)**
L'enregistrement commence quand une pression est exercée sur cette touche.
- 9 Commutateur mode de minuterie (TIMER MODE)**
C'est le commutateur de fonction pour l'enregistrement programmé par minuterie interne ou l'enregistrement programmé par minuterie externe. Les données ci-dessous s'affichent au registre.
INT: Aux heures réglées par la minuterie interne, le contact s'établit et se coupe automatiquement et l'enregistrement commence ou s'arrête.
OFF: L'enregistrement programmé est désactivé.
EXT: Quand le contact est établi sur l'appareil externe, l'enregistrement commence automatiquement.
- 10 Commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK)**
Lorsque ce commutateur est placé à la position REC LOCK, il n'est plus possible de régler le mode de temps ni d'actionner les touches de fonction ni l'interrupteur lorsqu'un enregistrement est en cours. Lorsqu'il est placé à la position MENU, l'écran du menu apparaît.
- 11 Touche rebobinage (réglage -) (REW)**
Lors d'une pression sur cette touche, le ruban se rebobine. Si la pression est maintenue sur la touche pendant la lecture, le mode révision est activé. Si un menu est affiché, la touche permet de régler les paramètres (de diminuer les valeurs).
- 12 Touche recul image par image (décalage ▼) (REV ADV)**
Si une pression est maintenue sur cette touche pendant un arrêt sur image, le ruban avance d'une image à la fois en sens arrière. Quand la touche est libérée, l'arrêt sur image réapparaît. Si la pression est exercée pendant qu'un menu est affiché, les paramètres de réglage se déplacent vers le bas.
- 13 Touche avance accélérée (réglage +) (FF)**
Quand une pression est exercée sur cette touche, le ruban défile rapidement vers l'avant. Si la pression est maintenue pendant la lecture, l'appareil commute en mode repérage. Si un menu est affiché, la touche permet de régler les paramètres (d'augmenter les valeurs).
- 14 Touche avance image par image (décalage ►) (FWD ADV)**
Si une pression est maintenue sur cette touche pendant un arrêt sur image, le ruban avance d'une image à la fois en sens avant. Quand la touche est libérée, l'arrêt sur image réapparaît. Lorsque cette touche est pressée en lecture en mode 24 heures ou 40 heures, il est possible d'activer ou de désactiver Quasi-V.

Affichage du mode de fonctionnement



Quasi-V Désactivé Activé

Le sautiellement pourra être réduit.
Si une pression est exercée sur cette touche pendant qu'un menu est affiché, les paramètres de réglage se déplacent vers la droite.

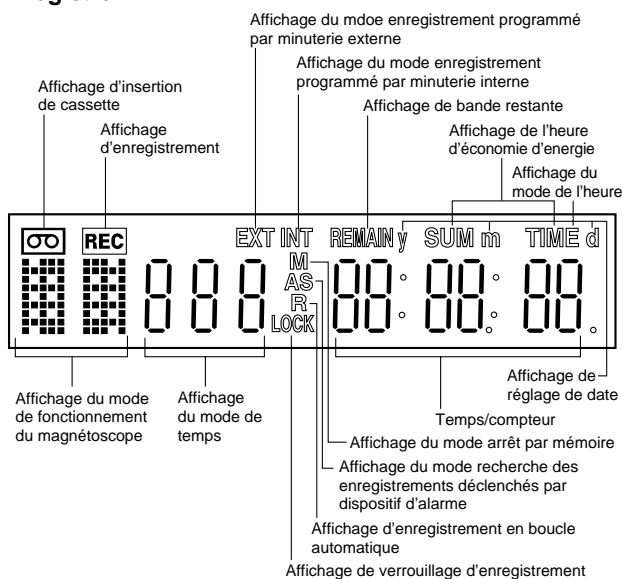
15 Touches pistage (–, +)/V-LOCK

Ces touches permettent de régler le pistage. Si des parasites apparaissent sur l'image de lecture, appuyer sur les touches pour régler le pistage de façon que l'image soit la plus nette possible. Lorsque les deux touches sont pressées simultanément en mode de lecture 8 heures, le pistage se règle automatiquement. Si l'image bouge légèrement dans le sens vertical pendant un arrêt sur image, appuyer sur les touches de blocage verticale (–, +) afin de réduire le sautiller. Par ailleurs, il est possible de régler l'emplacement d'affichage de l'horodateur pendant les opérations STOP et EJECT (voir page 13).

16 Touche réinitialisation (RESET)

Une pression sur cette touche permet de ramener l'affichage du compteur à 0:00:00.

17 Registre



• Affichage des modes de fonctionnement

Mode de fonctionnement	Affichage
Lecture	▷ ou ▷▷
Enregistrement	▷ Le voyant REC s'allume.
Arrêt sur image	□□
Pause d'enregistrement	□□ Le voyant REC s'allume.
Vérification d'enregistrement	▷ Le voyant REC s'allume.
Avance accélérée	▷▷
Rebobinage	◁◁
Repérage	▷▷
Révision	◁◁
Avance image par image	□□ ou ▷▷
Recul image par image	□□ ou ◁◁

• Messages d'erreur

Un code d'erreur apparaît lorsqu'une anomalie se produit pendant le fonctionnement.

E-2: Anomalie dans la section d'insertion de la cassette vidéo

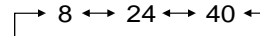
E-3: Anomalie dans la section de chargement de la cassette vidéo

E-4: Anomalie dans le cylindre des têtes

E-5: Anomalie dans la section de défilement du ruban
d: Formation de condensation (humidité)

18 Touches mode de temps (TIME MODE) (▼, ▲)

Ces touches permettent de sélectionner le mode de temps pour l'enregistrement et la lecture. Chaque fois qu'une pression est exercée sur la touche, le mode de temps change dans l'ordre suivant:



19 Touche compteur/recherche (COUNTER/SEARCH)

Lors d'une pression sur cette touche, les données de l'afficheur commutent alternativement sur l'heure, le compteur, la mémoire du compteur, le repérage des enregistrements sur alarme et le nombre de reprises de l'enregistrement.

Le voyant "M" apparaît au registre en mode mémoire du compteur. Lorsque le ruban est avancé en accéléré ou rebobiné dans ce mode, le compteur s'arrête automatiquement lorsqu'il approche de "0:00:00". L'indication "AS" apparaît au registre en mode repérage des enregistrements sur alarme. Lorsque le ruban est avancé en accéléré ou rebobiné dans ce mode, l'appareil commute automatiquement en mode arrêt sur image à la section de l'enregistrement déclenché sur signal d'alarme. Si la touche FF ou la touche REW sont pressées pendant une lecture avec repérage des enregistrements déclenchés sur signal d'alarme, le repérage se verrouille. (Si cette touche est pressée pendant une avance accélérée ou un rebobinage du ruban, la mémoire du compteur et le repérage des enregistrements déclenchés sur signal d'alarme ne fonctionneront pas.)

La marque "PAS." apparaît sur le registre en mode affichage de reprises de l'enregistrement. Le nombre de reprises de l'enregistrement n'est affiché que si TAPE END, sur le Menu 4, est réglé sur REPEAT.

La marque "PAS" s'affiche pour les paramètres autres que REPEAT.

20 Voyant d'enregistrement (REC)

Ce voyant s'allume lorsqu'un enregistrement est en cours. Il s'éteint lorsque l'enregistrement est terminé.

21 Voyant d'alarme (ALARM)

Il reste allumé pendant un enregistrement déclenché sur signal d'alarme. Il clignote quand l'enregistrement déclenché sur signal d'alarme prend fin.

22 Commande repérage/commande repérage progressif Commande repérage (bague externe)

Lorsque la bague externe de la commande repérage est tournée, le mode repérage est établi. Le ruban peut alors être révisé ou repéré à une vitesse allant jusqu'à 27 la vitesse de lecture normale.

Lorsque la commande repérage est placée à la position centrale enclenchée, le mode arrêt sur image est établi.

Commande repérage progressif (bague interne)

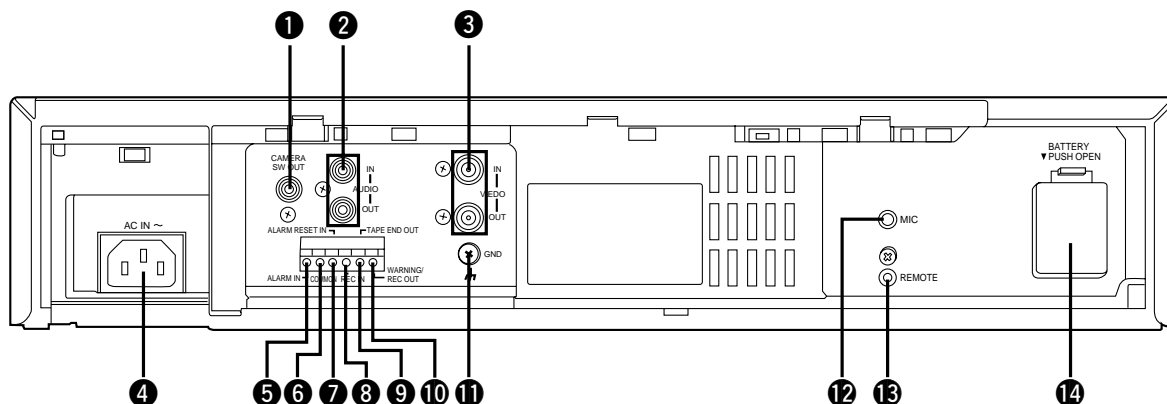
Lorsque la commande repérage est placée à la position centrale enclenchée, le mode repérage progressif est établi.

Lorsque la bague interne est tournée, il est possible de faire varier la vitesse du ruban jusqu'à –1 à +1 la vitesse de lecture normale. Quand la rotation est arrêtée, le mode arrêt sur image est établi.

- Pendant une lecture de repérage ou de repérage progressif, l'image risque d'être monochrome ou d'être déformée; ceci est normal.

- Aucun son n'est audible pendant une lecture de repérage ou de repérage progressif.

Les commandes et leurs fonctions



1 Prise de sortie de commutation des caméras

C'est la prise de sortie de commutation des caméras; la raccorder au commutateur cyclique.

2 Prises d'entrée/sortie audio

Ce sont les prises d'entrée/sortie audio (prises phono).

3 Prises d'entrée/sortie vidéo

Ce sont les prises d'entrée/sortie vidéo (BNC); raccorder la prise d'entrée à la caméra vidéo, etc., et la prise de sortie à l'écran témoin, etc.

4 Connecteur d'entrée C.A.

Ceci est pour raccorder l'appareil à une prise secteur à l'aide du cordon d'alimentation fourni.

5 Prise d'entrée d'alarme

C'est la prise d'entrée des enregistrements déclenchés sur signal d'alarme; la raccorder au détecteur externe.

6 Prise de mise à la terre

7 Prise de réinitialisation d'alarme

C'est la prise d'entrée pour la libération des enregistrements déclenchés sur signal d'alarme; elle nécessite une tension de +4 à +14 V c.c.

8 Prise d'entrée d'enregistrement

C'est la prise d'entrée pour l'enregistrement.

9 Prise de sortie de fin de ruban

Quand la cassette arrive en fin de ruban pendant un enregistrement, le dispositif d'alarme externe est activé.

10 Prise de sortie du signal d'avertissement/d'enregistrement

Lorsqu'une anomalie se produit dans l'appareil, le dispositif d'alarme externe est activé. Avertissement d'erreur, ou le signal d'enregistrement sélectionné sur le menu 3 est faible.

11 Borne de mise à la terre

Cette borne se raccorde à la borne de mise à la terre du signal de l'appareil raccordé, de manière à diminuer les parasites. Elle n'est pas raccordée à la terre dans un but de sécurité.

12 Prise d'entrée de microphone

C'est la prise d'entrée (mini-prise) d'un microphone externe.

Cette prise a priorité lorsque les signaux sont acheminés simultanément à cette prise et aux prises d'entrée audio.

13 Connecteur de télécommande

Pour le raccordement de la télécommande AG-A11, vendue séparément.

14 Section d'installation de la pile

Installer la pile dans cette cavité. Voir "Pile au lithium", à la page 2.

Les menus

L'un de ces menus apparaît à l'écran témoin lorsque le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) est placé à la position MENU. Le registre revient à l'écran normal si le commutateur est placé à la position OFF.

- Lorsqu'un menu est affiché, les paramètres se règlent à l'aide des touches page, décalage et réglage.
- Pour avancer dans les pages du menu (page suivante), utiliser la touche page.
- Pour se déplacer dans les paramètres (vers le bas ou vers la droite), utiliser la touche décalage.
- Pour régler les paramètres (augmenter ou diminuer les valeurs), utiliser la touche réglage.

MENU 1

[TIME ADJUST]	P1	
1-01-2000 SAT		1
0:00:00		2
[REC LOCK]		
MODE : OFF		3
[HOUR METER]		
00000H		4

MENU 2

[DISPLAY]	P2	
POSITION : L-UPPER		5
[REC INDICATE]		
NOT REC : CAMERA		6
[BUZZER]		
ALARM : OFF		
TAPE END : OFF		7
TAPE REMAIN : OFF		
ERR WARN : OFF		

MENU 3

[ALARM]	P3	
MODE : OFF		8
DURATION : 30SEC		9
[RECALL]	-	10
-		
-		
[OUTPUT SELECT]		
TERMINAL OUT : ERR WARN		11

MENU 4

[REC MODE]	P4	
REC T-MODE : OFF		12
TAPE IN : STOP		13
TAPE END : STOP		14
[VIDEO MODE]		
MODE : AUTO		15
DETAIL : ON		16

MENU 5

[INTERNAL TIMER REC]	P5	
[TIMER] START END T-M		17
SUN OFF		
MON OFF		
TUE OFF		
WED OFF		
THU OFF		
FRI OFF		
SAT OFF		
DLY OFF		

MENU 6

[DAYLIGHT SAVINGS]	P6	
MODE : OFF		18
[START] [END]		19
WEEK : 1ST-SUN ▶ LST-SUN		20
MONTH : 4 ▶ 10		
TIME : 2:00 ▶ 2:00		
[DIRECT SEARCH]		
MODE : OFF		21

MENU 1

Outre la date, l'heure et le verrouillage du mode enregistrement qui apparaissent à l'écran témoin, le menu 1 permet d'afficher l'horodateur.

1 Réglage de la date (voir page 12)

2 Réglage de l'heure (voir page 12)

3 Verrouillage du mode enregistrement

ON: LOCK clignot sur le tube cathodique avant, et toutes les opérations à l'exception de la revue d'enregistrement sont interdites pendant l'enregistrement.

4 Horodateur (voir page 5)

Il indique la durée d'utilisation totale de l'appareil (le temps total cumulé de rotation du cylindre des têtes).

MENU 2

Le menu 2 permet de sélectionner l'emplacement de l'affichage et l'affichage d'un écran bleu sur le moniteur, ainsi que d'effectuer les réglages de l'avertisseur sonore.

5 Sélection de l'emplacement d'affichage (voir page 13)

Ce paramètre sélectionne l'emplacement de l'affichage de la date/heure sur l'écran témoin.

(L-UPPER ↔ R-UPPER ↔ L-BOTTOM ↔ R-BOTTOM ↔ CENTER ↔ OFF ↔ L-UPPER...)

6 Affichage bleu

Ce paramètre permet d'obtenir en permanence un affichage bleu sur le moniteur, sauf pendant l'enregistrement et la lecture.

BLUE: L'affichage du moniteur est bleu en permanence, sauf pendant l'enregistrement et la lecture.

CAMERA: Les images du connecteur d'entrée vidéo apparaissent en permanence sur le moniteur, sauf pendant la lecture.

7 Déclenchement de l'avertisseur sonore

Ce paramètre permet de régler le déclenchement de l'avertisseur sonore.

ALARM: L'avertisseur sonore retentit lorsqu'un enregistrement déclenché par dispositif d'alarme s'effectue.

TAPE END: Lorsque la cassette arrive en fin de bande en mode enregistrement, l'avertisseur sonore retentit lorsque la bande est finie.

TAPE REMAIN: L'avertisseur sonore retentit lorsqu'il ne reste plus que 3% de bande (avec une cassette NV-T120/T160) avant la fin de la cassette en mode enregistrement.

ERR WARN: L'avertisseur sonore retentit lorsque l'appareil est en état d'avertissement.

Pour libérer l'avertisseur sonore:

ALARM: Libérer l'enregistrement déclenché par dispositif d'alarme.

TAPE END: Changer de mode à la fin de la bande ou appuyer sur la touche STOP.

TAPE REMAIN: Changer de mode (à l'exception du mode pause et revue d'enregistrement) à partir du mode d'enregistrement ou appuyer sur la touche REC.

ERR WARN: Libérer l'état d'avertissement.

- SI TAPE END ou TAPE REMAIN sont invalidés (OFF), l'avertisseur sonore ne retentira pas; cependant, l'affichage REMAIN restera éclairé ou clignotant.
- Lorsque TAPE END ou TAPE REMAIN a été réglé sur ON, REMAIN s'allume ou clignot sur le tube cathodique en même temps que l'avertisseur sonore retentit. Ils cessent de clignoter lorsque l'avertisseur sonore est libéré.

Remarque:

Le temps de ruban restant ne s'affiche qu'avec les cassettes NV-T120 et NV-T160. Il ne s'affiche pas avec les autres types de cassettes.

Les menus

MENU 3

Le mode d'enregistrement déclenché sur signal d'alarme et la sortie aux bornes se règlent à l'écran de menu 3.

8 Sélection du mode enregistrement déclenché sur signal d'alarme (voir page 20)

En cas d'une entrée d'alarme, le mode enregistrement est sélectionné. (OFF → ALARM)

ALARM: Lorsqu'il y a une entrée d'alarme pendant un enregistrement en mode de temps échelonné, la vitesse d'enregistrement commute en mode "8H" (enregistrement déclenché sur signal d'alarme) et les détails de l'état d'alarme s'enregistrent fidèlement.

OFF: L'enregistrement déclenché sur signal d'alarme n'est pas possible si le signal d'alarme est envoyé pendant l'enregistrement.

9 Réglage de la durée des enregistrements déclenchés sur signal d'alarme

Ce paramètre permet de régler le temps qui s'écoule entre le début de l'enregistrement déclenché sur signal d'alarme et sa fin. Le temps pourra être réglé dans la plage de 0,5 à 10 minutes. (30 SEC ↔ 1 MIN ↔ 2 MIN ↔ 3 MIN ↔ 5 MIN ↔ 10 MIN ↔ CONTINUE ↔ MANUAL)

CONTINUE: L'enregistrement déclenché sur signal d'alarme se poursuit jusqu'à la fin de la cassette.

MANUAL: L'enregistrement déclenché sur signal d'alarme se poursuit pendant tout le temps de l'entrée d'alarme.

10 Rappel des enregistrements sur alarme (voir page 28)

Ce paramètre permet de vérifier le nombre d'entrées (4 maximum) de signaux d'alarme.

11 Réglage du signal de sortie du connecteur de borne

ERR WARN: S'il se produit une anomalie dans l'appareil (AUTO OFF), un signal LOW est envoyé.

REC: Un signal LOW est envoyé pendant un enregistrement.

MENU 4

Le mode d'enregistrement et la sortie vidéo se règlent à l'écran de menu 4.

12 Sélection du mode de temps d'enregistrement

Lorsque l'enregistrement commence, le mode de temps réglé est activé d'office. (OFF → 8H → 24H → 40H)

OFF: Il est possible de régler le mode de temps de son choix à l'aide de la touche mode de temps (TIME MODE) du panneau avant. Le réglage est possible même pendant l'enregistrement.

13 Sélection du fonctionnement du magnétoscope sur insertion de la cassette

STOP: Mode arrêt

REC: Il suffit d'insérer la cassette pour que l'enregistrement commence automatiquement.

REW ► REC: Lorsque la cassette est insérée, elle commence par se rebobiner jusqu'au début du ruban, puis l'enregistrement commence automatiquement.

14 Sélection du fonctionnement lorsque la fin de ruban est détectée pendant un enregistrement (voir page 18)

STOP: Mode arrêt

REW: Le ruban se rebobine automatiquement jusqu'au début, puis il s'arrête.

REPEAT: Le ruban se rebobine automatiquement jusqu'au début, et la reprise automatique d'enregistrement s'effectue.

EJECT: La cassette est éjectée.

15 Mode de signal vidéo

Ce paramètre sélectionne le fonctionnement du circuit de sélection automatique couleur/noir et blanc.

AUTO: Le circuit identifie automatiquement le type des signaux d'entrée ou de lecture vidéo, et il sélectionne le mode couleur ou noir et blanc en conséquence.

COLOR: Le mode couleur est impérativement activé.

B_W: Le mode noir et blanc est impérativement activé.

16 Sélection de la qualité des images de lecture

Ce paramètre permet de souligner les contours de l'image de lecture.

OFF: Mode normal

ON: Les contours de l'image de lecture sont soulignés.

MENU 5

Le menu 5 permet de régler les modes enregistrement programmé par minuterie interne.

17 Réglage du mode enregistrement programmé par minuterie interne (voir page 16)

Ce paramètre permet de régler le mode programmation hebdomadaire ou programmation quotidienne. (OFF/ON)

OFF: Pour désactiver le mode enregistrement programmé par minuterie interne.

ON: Pour activer le mode enregistrement programmé par minuterie interne. (Pour régler les heures de début et d'arrêt.)

Remarque:

L'enregistrement programmé par minuterie interne ne fonctionnera pas si la date et l'heure n'ont pas été réglées.

MENU 6

Le menu 6 permet de sélectionner le mode d'heure d'économie d'énergie et le mode de fonctionnement de la commande repérage et de la commande repérage pas à pas.

18 Sélection du mode d'heure d'économie d'énergie

Sélectionner le mode d'heure d'économie d'énergie.

ON: Le mode d'heure d'économie d'énergie est sélectionné.

OFF: Le mode d'heure d'économie d'énergie n'est pas sélectionné.

19 Réglage de l'heure de début de l'heure d'économie d'énergie

Régler la semaine, le mois et l'heure auxquels l'heure d'économie d'énergie doit débuter.

WEEK: Sélectionner 1ST, 2ND, 3RD, 4TH ou LST (dernier) et l'un des jours de SUN (dimanche) à SAT (samedi).

MONTH: Sélectionner le mois de début (1 – 12).

TIME: Sélectionner l'heure de début (1:00 – 22:00)*.

20 Réglage de l'heure de fin de l'heure d'économie d'énergie

Régler la semaine, le mois et l'heure auxquels l'heure d'économie d'énergie doit prendre fin.

WEEK: Sélectionner 1ST, 2ND, 3RD, 4TH ou LST (dernier) et l'un des jours de SUN (dimanche) à SAT (samedi).

MONTH: Sélectionner le mois de début (1 – 12).

TIME: Sélectionner l'heure de début (1:00 – 22:00)*.

21 Réglage du mode de fonctionnement de la commande repérage et de la commande repérage pas à pas

Régler le mode de fonctionnement pour l'utilisation de la commande repérage ou de la commande repérage pas à pas depuis un autre mode.

ON: Il est possible d'actionner la commande directement pendant les opérations STOP et STILL.

OFF: Il faut d'abord appuyer sur la touche STILL pour pouvoir utiliser la commande.

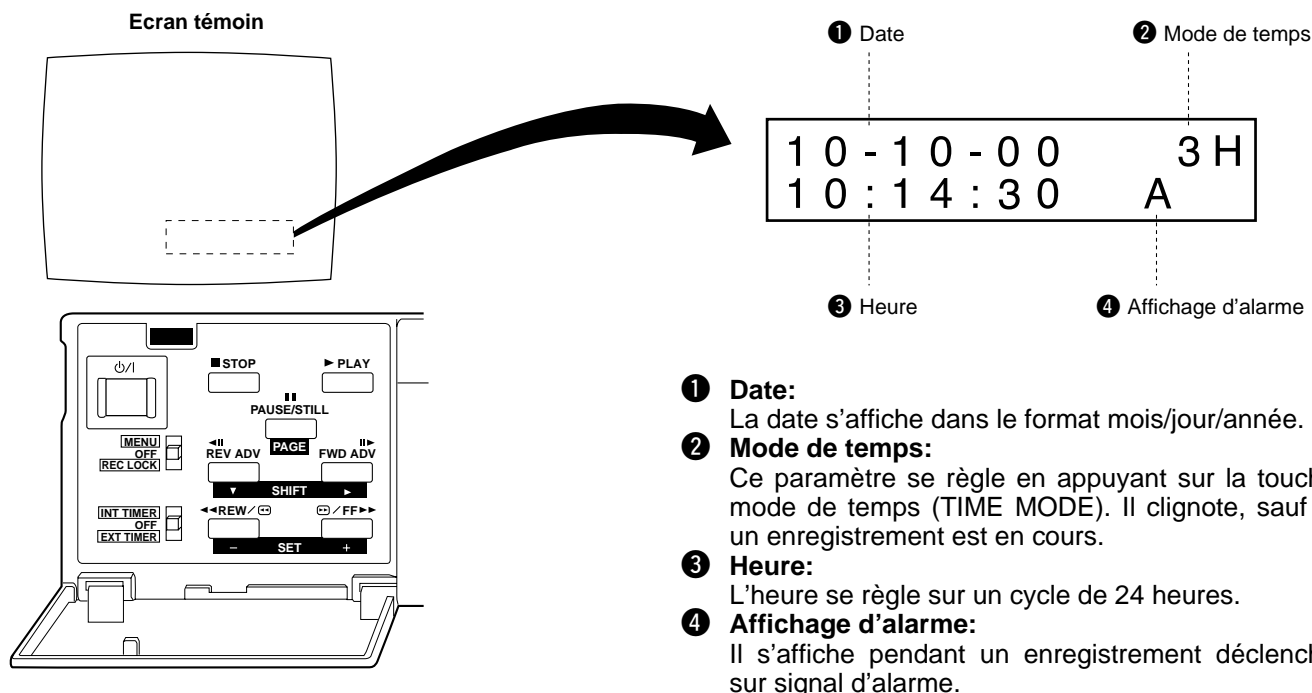
* Les minutes servent uniquement de référence; il n'est pas possible de les régler.

Précautions:

- Les menus ne s'affichent pas pendant la lecture d'une cassette.
- Il est possible de modifier les paramètres de l'écran de menu 1 pendant que l'appareil effectue un enregistrement; les écrans de menu 2 à 6, quant à eux, servent uniquement de référence, et il n'est donc pas possible de les modifier.

Réglage de la date et de l'heure

L'appareil est doté d'un générateur horodateur incorporé qui permet d'afficher la date et l'heure en surimpression pendant l'enregistrement. Lorsque le contact est établi, la date, l'heure et le mode de temps s'affichent (dans le cas d'un écran normal).



- 1 **Date:**
La date s'affiche dans le format mois/jour/année.
- 2 **Mode de temps:**
Ce paramètre se règle en appuyant sur la touche mode de temps (TIME MODE). Il clignote, sauf si un enregistrement est en cours.
- 3 **Heure:**
L'heure se règle sur un cycle de 24 heures.
- 4 **Affichage d'alarme:**
Il s'affiche pendant un enregistrement déclenché sur signal d'alarme.

Exemple: Pour régler l'horodateur sur samedi 3 mars 2001, 3h 25. Le mode de temps réglé est le mode 40 heures.

- 1 Placer le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) à la position MENU. Le menu 1 apparaît et les chiffres de l'année clignotent.

Affichage du moniteur

[TIME ADJUST] P1
1-01-2000 SAT
0:00:00

Section d'affichage

y m d
00:01:01

- 2 Appuyer sur les touches réglage [SET (+, -)] pour régler l'année sur "2001".

[TIME ADJUST] P1
1-01-2001 MON
0:00:00

y m d
01:01:01

- 3 Quand une pression est exercée sur la touche décalage (▶), les chiffres du mois clignotent. Appuyer sur les touches SET (+, -) pour régler le mois sur "3".

[TIME ADJUST] P1
3-01-2001 THU
0:00:00

y m d
03:01:01

- 4 Quand une pression est exercée sur la touche décalage (▶), les chiffres du jour clignotent. Appuyer sur les touches réglage [SET (+, -)] pour régler le jour sur "03".

[TIME ADJUST] P1
3-03-2001 SAT
0:00:00

y m d
03:03:00

• L'année pourra être réglée entre 2000 et 2079.

- 5 Quand une pression est exercée sur la touche décalage (▼), les chiffres des heures clignotent. Appuyer sur les touches SET (+, -) pour régler les heures sur "3".

[TIME ADJUST] P1
3-03-2001 SAT
3:00:00

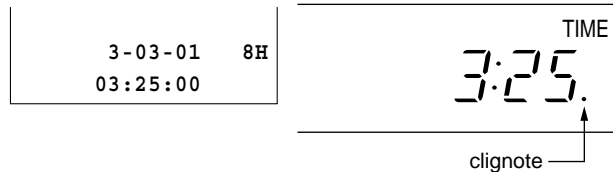
TIME
3:00

- 6 Quand une pression est exercée sur la touche décalage (▶), les chiffres de minutes clignotent. Appuyer sur les touches SET (+, -) pour régler les minutes sur "25".

[TIME ADJUST] P1
3-03-2001 SAT
3:25:00

TIME
3:25

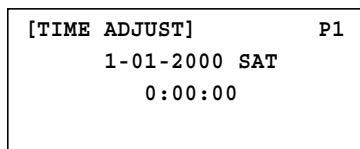
- 7 Quand le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) est placé à la position OFF, l'horloge commence automatiquement à fonctionner à partir de l'heure et du jour réglés.



Les secondes se règlent sur "00".

Si l'heure n'a pas été modifiée, elle continuera à avancer même si le commutateur est placé à la position MENU.

- Pour effacer l'affichage de la date et de l'heure, régler le paramètre POSITION, sous (DISPLAY) du menu 2, à la position OFF.
- La date, l'heure et les autres données du mode de temps affichées seront conservées dans la mémoire même en cas de panne d'alimentation se prolongeant jusqu'à une semaine, à condition toutefois que l'appareil ait été alimenté continuellement pendant au moins trois jours. Si l'appareil vient juste d'être acheté, ou s'il n'a pas fonctionné pendant longtemps, les données ne seront pas mémorisées et l'écran ci-dessous apparaît.

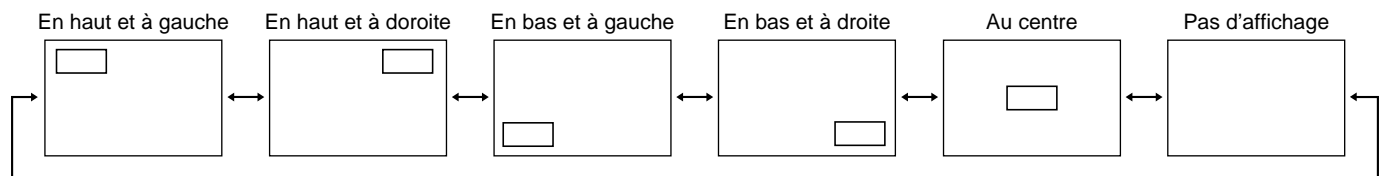


Lorsque le temps a été ramené à "0:00:00" comme expliqué, vérifier les réglages du menu. Si certains réglages sont incorrects, les recommencer.

- Pour le réglage de la date, l'appareil règle automatiquement les années bissextiles.
- Pour diverses raisons comme les fluctuations de température notamment, l'heure peut avancer ou retarder dans la limite d'une erreur mensuelle de ± 60 secondes. Ceci est normal. Rerégler l'heure régulièrement.

Emplacement d'affichage de la date/heure

L'emplacement de l'affichage de la date et de l'heure sur l'écran témoin change comme suit lorsque le paramètre (DISPLAY) du menu 2 est modifié.



- 1 Placer le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) à la position MENU pour afficher les menus. Appuyer sur la touche page pour afficher le menu 2 à l'écran témoin.

POSITION : ~~L-UPPER~~

- 2 Appuyer sur les touches réglage (+, -) pour disposer l'affichage à l'emplacement de son choix.

POSITION : ~~L-BOTTOM~~

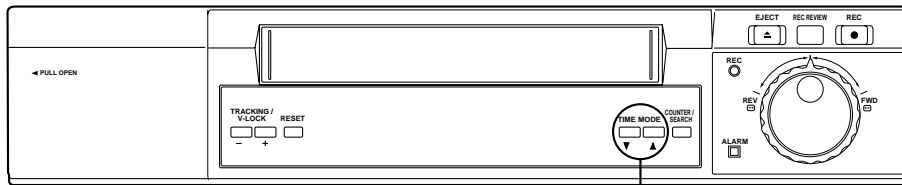
- 3 Lorsque les réglages sont terminés, placer le commutateur menu/verrouillage du mode enregistrement à la position OFF. L'écran normal réapparaît, et la date et l'heure sont affichées à l'emplacement sélectionné.

Fonction de réglage de la position de l'affichage TIME/DATE

Lorsque l'appareil est en mode arrêt ou éjection, il est possible de régler la position de l'heure/date affichées en appuyant sur la touche TRACKING (-) ou TRACKING (+).

- Appuyer sur la touche TRACKING (-) pour déplacer l'affichage en sens vertical. (Le fait d'appuyer 3 fois sur la touche ramènera l'affichage à sa position d'origine.)
- Appuyer sur la touche TRACKING (+) pour déplacer l'affichage en sens horizontal. (Le fait d'appuyer 3 fois sur la touche ramènera l'affichage à sa position d'origine.)
- Appuyer simultanément sur les touches (-) et (+) pour ramener l'affichage à sa position d'origine (réglage en usine).

Sélection du mode de temps



Touche mode de temps (TIME MODE)

Pour sélectionner le mode qui convient pour l'application, se reporter au tableau ci-dessous.

Type de ruban Mode	Durée d'enregistrement (heures)				Intervalle d'enregistrement vidéo (secondes)	Enregistrement du son	Intervalle de commutation des caméras (secondes)	Mode de défilement
	NV-T160	NV-T120	NV-T90	NV-T60				
8 heures	8	6	4,5	3	1/60	Oui	1/30	Défilement continu à 11,12 mm/s
24 heures	24	18	13,5	9	0,05	Oui	0,05	Défilement continu à 3,71 mm/s
40 heures	40	30	22,5	15	0,083	Oui	0,083	Défilement continu à 2,22 mm/s

Remarques sur le fonctionnement

- Les cassettes de référence de l'appareil sont les cassettes NV-T160.
- L'appareil permet une durée d'enregistrement maximale de 40 heures avec une cassette NV-T160.
- La durée d'enregistrement varie en fonction du type de cassette vidéo utilisé.
- L'enregistrement du son est possible dans tous les modes de temps.
- Les modes 24 heures et 40 heures sont les modes temps échelonné. Les images sont enregistrées avec des sauts d'image pour permettre des enregistrements et lectures très longue durée.
- Une cassette enregistrée en mode temps échelonné (24 heures/40 heures) pourra être lue en accéléré en mode 8 heures.
- Une cassette enregistrée en mode 8 heures pourra être lue au ralenti à l'aide du mode temps échelonné (24 heures/40 heures).
- Un ruban enregistré en mode 2 heures sur un autre magnétoscope pourra être lu en mode 2 heures.
- Les cassettes enregistrées sur cet appareil ne pourront pas être lues sur d'autres appareils vidéo VHS car elles ne sont pas compatibles.

Sélection des cassettes

L'appareil est conçu pour garantir une haute fiabilité dans un système de surveillance, sécurité, contrôle, etc. Pour pouvoir préserver sa fiabilité d'enregistrement, il est recommandé d'utiliser les cassettes vidéo Panasonic de la liste ci-dessous.

- <Cassettes VHS>
- NV-T160
 - NV-T120
 - NV-T90
 - NV-T60
 - NV-T30

- Eviter d'utiliser des cassettes de 180 minutes sur cet appareil.

Procédure d'enregistrement

- ❶ Etablir le contact sur l'appareil raccordé.
- ❷ Régler de façon que les images des caméras vidéo apparaissent de façon satisfaisante à l'écran témoin.
- ❸ Vérifier que la date et l'heure affichées à l'écran témoin sont exactes.
- ❹ Insérer une cassette dans l'appareil après avoir vérifié que sa languette est intacte.
- ❺ Régler la fonction d'enregistrement voulue: enregistrement programmé, reprise automatique d'enregistrement, enregistrement déclenché sur signal d'alarme, enregistrement avec reprise d'enregistrement après rétablissement de l'alimentation suite à une panne, etc.
- ❻ Sélectionner le mode de temps pour l'enregistrement.
- ❼ Appuyer sur la touche enregistrement (REC).

Remarques sur le fonctionnement

- Si une pression est exercée sur la touche pause/arrêt sur image (PAUSE/STILL) pendant l'enregistrement, l'appareil commute en mode pause, et au bout de 5 minutes environ en mode pause, il commute en mode arrêt.
- Il ne sera pas possible d'obtenir une parfaite continuité des images si le mode enregistrement est réactivé après pression sur la touche pause/arrêt sur image pendant l'enregistrement.
- Si le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) a été placé à la position OFF, il sera possible d'effectuer d'autres opérations pendant l'enregistrement.
- Lors d'un enregistrement avec reprise d'enregistrement après rétablissement de l'alimentation suite à une panne, l'enregistrement se poursuivra dans le même mode de temps après rétablissement de l'alimentation, à condition que l'alimentation soit rétablie dans l'intervalle d'une semaine. (Ceci n'est valable que si l'appareil a été alimenté continuellement pendant au moins trois jours.)
- Lors d'une reprise automatique d'enregistrement ou d'un enregistrement programmé, ne pas négliger d'effectuer les vérifications périodiques.
- Pour enregistrer des images avec une caméra noir et blanc, régler le mode de signal vidéo du menu 4 sur B/W.
- Sortir la cassette de l'appareil si l'appareil doit rester longtemps sans fonctionner.
- Si l'alimentation du magnétoscope est interrompue pendant l'enregistrement (alors que l'interrupteur est toujours en contact), une section non enregistrée sera créée au début du défilement de la bande, ou bien la bande sera surenregistrée sur la section de fin. Ces phénomènes ne sont pas le signe d'une anomalie.

Conseils pour obtenir de meilleurs enregistrements

Pour pouvoir garantir une plus grande fiabilité lors d'opérations continues se prolongeant sur plusieurs heures, notamment pour des opérations de contrôle et de surveillance, l'appareil est doté d'un certain nombre de fonctions de sécurité qui garantissent la réalisation des enregistrements. Lire ci-dessous la description de ces fonctions avant d'utiliser l'appareil.

Verrouillage du mode enregistrement

Il y a deux façons, décrites ci-dessous, d'assurer le maintien du mode enregistrement une fois qu'il a été activé en désactivant le fonctionnement de l'interrupteur ainsi que le mode de temps et les touches de fonction.

- ❶ Placer le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) à la position REC LOCK.
- ❷ Régler le paramètre REC LOCK du menu 1 à la position ON. (Voir la remarque.)

La touche et les prises ci-dessous sont opérationnels pendant l'enregistrement même si le commutateur menu/verrouillage du mode enregistrement est placé à la position REC LOCK.

- Prise d'entrée d'alarme, prise de réinitialisation d'alarme
- Revue d'enregistrement

Vérification des enregistrements

Si une pression est exercée sur la touche REC CHECK pendant l'enregistrement, le ruban défile temporairement en sens arrière, et la section enregistrée est reproduite. Cette fonction permet de vérifier le fonctionnement quotidien des appareils du système.

Enregistrement avec reprise d'enregistrement après rétablissement de l'alimentation suite à une panne

Lorsqu'une panne d'alimentation se produit pendant un enregistrement, l'appareil reprendra automatiquement l'enregistrement si l'alimentation est rétablie dans l'intervalle d'une semaine.

- Lors d'une panne d'alimentation, la fonction de protection de sécurité contre le relâchement du ruban se déclenche afin de protéger les têtes et le ruban vidéo.

Avant le rétablissement de l'alimentation	Après le rétablissement de l'alimentation
• Arrêt, lecture, avance accélérée	Le mode arrêt est activé.
• Enregistrement	Le mode enregistrement est activé.
• Rebobinage automatique • Rebobinage automatique pendant une reprise automatique d'enregistrement	L'appareil revient au mode en vigueur avant l'interruption de l'alimentation.

Remarques:

- Si le fil d'alimentation s'est débranché de la prise secteur ou qu'il s'est produit une panne de courant, aucune opération ne sera reconnue pendant environ 30 secondes après que le courant est revenu, ceci afin de protéger le ruban.
- Une fois que le mode enregistrement a été activé, l'enregistrement ne pourra être désactivé qu'en plaçant le paramètre REC LOCK du menu 1 à la position OFF.

Enregistrement programmé

Il existe deux méthodes d'enregistrement programmé: l'une fait intervenir la minuterie interne, et l'autre utilise une minuterie externe.

Enregistrement programmé par minuterie interne

Heure de début et heure d'arrêt

Noter les points suivants lors du réglage de ces deux heures.

- **Si l'heure d'arrêt est ultérieure à l'heure de début:**
L'enregistrement commence à l'heure de début de la journée indiquée et s'arrête à l'heure de fin, le même jour.
Exemple: 8:30 → 17:00
- **Si l'heure de début est ultérieure à l'heure d'arrêt, ou si l'heure de début et l'heure d'arrêt d'une programmation hebdomadaire (minuterie hebdomadaire) sont les mêmes:**
L'enregistrement commencera à l'heure de début, le jour en question, et il s'arrêtera à l'heure d'arrêt le lendemain.
Exemple: 17:00 → 8:30
- **Si l'heure de début et l'heure d'arrêt sont les mêmes (programmation hebdomadaire):**
L'enregistrement commencera à 8h 30 le jour en question, et il s'arrêtera à 8h 30 le lendemain.
Exemple: 8:30 → 8:30
Pour enregistrer pendant une journée entière, régler l'heure début et l'heure d'arrêt sur 0:00.

Opérations effectuées sur le magnétoscope après les réglages

- Le contact se coupe et toutes les autres touches sont inopérantes.
- Si l'heure de début et l'heure d'arrêt n'ont pas été réglées, le voyant INT clignote au registre.

Libération du mode minuterie interne

Placer le commutateur mode de minuterie (TIMER MODE) sur OFF de façon que le voyant INT s'éteigne au registre.

Remarque:

- Etant donné qu'il faut un certain temps pour que l'enregistrement commence effectivement, régler l'heure de début des enregistrements programmés en avance d'une minute.

- La programmation hebdomadaire (minuterie hebdomadaire) pourra être réglée pour un jour de la semaine.
- Lorsque le paramètre (INTERNAL TIMER REC) du menu 5 est réglé à la position OFF à la fois pour la minuterie hebdomadaire et pour la programmation quotidienne (minuterie quotidienne), rien ne s'affiche pour les heures de début et d'arrêt. L'appareil juge que l'enregistrement programmé n'est pas réglé.

Procédure d'enregistrement programmé par minuterie interne

- 1 Vérifier qu'il y a une cassette, avec sa languette intacte, dans l'appareil.
- 2 Vérifier que la date et l'heure affichées sur le moniteur vidéo sont exactes.
- 3 Placer le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) à la position MENU pour afficher le menu. Appuyer sur la touche page de façon que l'écran de réglage de la minuterie (INTERNAL TIMER REC) apparaisse à l'écran témoin.
- 4 Régler les heures de fonctionnement de la minuterie interne.
 - Pour les détails, voir les sections relatives à la "Minuterie quotidienne" ou à la "Minuterie hebdomadaire". (Voir page 17.)
- 5 Lorsque les réglages sont terminés, placer le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) à la position OFF. L'écran normal réapparaît.
- 6 Placer le commutateur mode de minuterie (TIMER MODE) sur INT TIMER de façon que le voyant INT s'allume au registre.

```
[INTERNAL TIMER REC]  P5

[TIMER] START  END   T-M
SUN OFF
MON OFF
TUE OFF
WED OFF
THU OFF
FRI OFF
SAT OFF
DLY OFF
```

Si l'heure et la date de l'écran de menu 1 ne sont pas réglées, qu'il n'y a pas de cassette dans l'appareil, que la minuterie n'est pas réglée ou que la languette de la cassette insérée est brisée, l'avertisseur sonore retentit et INT clignote à l'affichage.

Programmation quotidienne (minuterie quotidienne)/ programmation hebdomadaire (minuterie hebdomadaire)

Exemple: Pour enregistrer de 8h 30 à 12h 00 de dimanche à jeudi, et de 9h 00 à 12h 00 le vendredi et le samedi

- Vérifier que le voyant OFF ou ON clignote pour dimanche (SUN). Si le paramètre est réglé à la position OFF, appuyer sur les touches réglage (+, -) de façon à afficher ON.

[INTERNAL TIMER REC] P5			
[TIMER]	START	END	T-M
SUN	OFF		
MON	OFF		

- Si une pression est exercée sur la touche décalage (▶), le réglage se déplace sur l'heure de début et les chiffres de "heures" se mettent à clignoter.

SUN ON 0:00▶ 0:00

- Appuyer sur les touches réglage (+, -) de façon à afficher "8".

SUN ON 8:00▶ 0:00

- Si une pression est exercée sur la touche décalage (▶), les chiffres des "minutes" se mettent à clignoter.

SUN ON 8:30▶ 0:00

- Appuyer sur les touches réglage (+, -) de façon à afficher "30".

SUN ON 8:30▶ 0:00

- Si une pression est exercée sur la touche décalage (▶), les chiffres des "heures" se mettent à clignoter.

SUN ON 8:30▶ 0:00

- Appuyer sur les touches réglage (+, -) de façon à afficher "12".

SUN ON 8:30▶ 12:00

- Si une pression est exercée sur la touche décalage (▶), les chiffres des "minutes" se mettent à clignoter.

SUN ON 8:30▶ 12:00

- Appuyer sur les touches réglage (+, -) de façon à afficher "00".

SUN ON 8:30▶ 12:00

- Appuyer sur la touche décalage (▶) et régler le mode de temps d'enregistrement. Lorsqu'on appuie sur la touche décalage (▼), l'indication MON clignote.

SUN ON 8:30▶ 12:00 24

- Recommencer les opérations des étapes 1 à 10 pour régler l'heure de début à "8:30" et l'heure d'arrêt à "12:00" de lundi (MON) à jeudi (THU).

Recommencer les opérations ci-dessus pour régler également les heures du vendredi (FRI) et du samedi (SAT).

De la sorte, les heures de fonctionnement de la minuterie sont réglées pour chaque jour de la semaine.

Recommencer également les opérations des étapes 1 à 10 pour régler la programmation quotidienne (minuterie quotidienne).

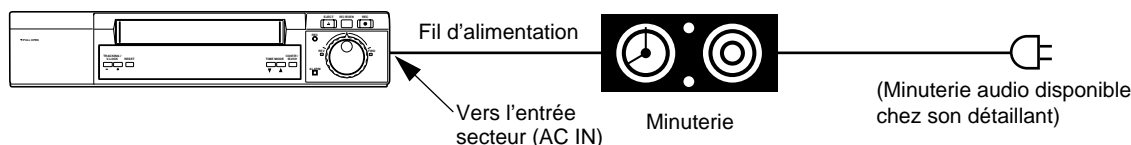
- Les données affichées à l'écran de gauche représentent les combinaisons de programmations hebdomadaires et quotidiennes indiquées ci-dessous qui, à leur tour, donnent la durée d'enregistrement réelle du ruban indiquée au bas de l'écran.

[INTERNAL TIMER REC] P5												
					Dimanche	Lundi	Mardi	Mercredi	Jeudi	Vendredi	Samedi	
[TIMER]	START	END	T-M		24H	24H	12H		12H		24H	
SUN	ON	8:30	8:00	24	8:00 8:30	8:00 14:00			14:00 23:00		12:00	
MON	ON	12:00	14:00	12		12:00						
TUE	OFF											
WED	OFF											
THU	ON	14:00	23:00	12								
FRI	OFF											
SAT	ON	12:00	8:00	24								
DLY	ON	18:00	8:00	12								

Enregistrement programmé

Enregistrement programmé par minuterie externe

Il est possible de régler l'appareil de façon que l'enregistrement soit déclenché par établissement du contact au moyen d'une minuterie externe.



Procédure d'enregistrement programmé par minuterie externe

- 1 Vérifier qu'il y a une cassette, avec sa languette intacte, dans l'appareil.
 - 2 Placer le commutateur mode de minuterie (TIMER MODE) sur EXT TIMER de façon que le voyant EXT s'allume au registre. A l'heure réglée, l'alimentation est fournie par la minuterie externe et l'appareil commute en mode enregistrement.
- S'il n'y a pas de cassette vidéo dans l'appareil, ou si sa languette de prévention d'effacement accidentel a été brisée, le voyant EXT clignote au registre et l'enregistrement programmé par minuterie externe n'est pas possible.
 - Etant donné qu'il faut un certain temps pour que l'enregistrement commence effectivement, régler l'heure de début des enregistrements programmés en avance d'une minute.
 - Selon la position du ruban, il est possible que certaines images ne s'enregistrent pas au début de l'enregistrement par minuterie externe, ou qu'elles s'enregistrent sur les images de la fin d'un enregistrement par minuterie externe précédent.

Reprise automatique d'enregistrement/rebobinage automatique

Reprise automatique d'enregistrement: Cette fonction rebobine automatiquement le ruban lorsque la fin du ruban est détectée en mode enregistrement, et elle reprend l'enregistrement depuis le début du ruban.

Rebobinage automatique: Cette fonction rebobine automatiquement le ruban jusqu'au début lorsque la fin du ruban est détectée en mode enregistrement.

- 1 Vérifier qu'il y a une cassette, avec sa languette intacte, dans l'appareil.
- 2 Placer le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) sur MENU pour afficher les menus. Appuyer sur la touche page pour afficher le menu 4 à l'écran témoin.
- 3 Appuyer sur la touche décalage (▼) pour amener le clignotement sur TAPE END. Appuyer sur la touche réglage (+ ou -) pour afficher REPEAT pour une reprise automatique d'enregistrement, ou REW pour un rebobinage automatique.
- 4 "R" clignote au registre.
 - Si le rebobinage automatique a été sélectionné, "R" s'éteint.
- 5 Lorsque les réglages sont terminés, placer le commutateur menu/verrouillage du mode enregistrement à la position OFF. L'écran normal revient.

```
[REC MODE] P4
REC T-MODE : OFF
TAPE IN : STOP
TAPE END : STOP

[VIDEO MODE]
MODE : AUTO
DETAIL : ON
```

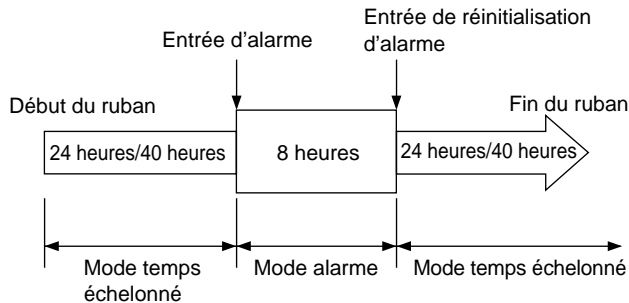
Remarques sur le fonctionnement

- Lors d'une reprise automatique d'enregistrement, ne pas négliger d'effectuer les vérifications périodiques. L'image se dégradant si le même ruban est constamment utilisé pour effectuer la reprise automatique d'enregistrement, remplacer la cassette par une neuve tous les 50 enregistrements environ. Lorsque la cassette est retirée puis réinsérée, le nombre se réinitialise sur 01.
- Les signaux d'alarme ne sont pas acceptés pendant un rebobinage automatique, de sorte que les enregistrements déclenchés sur signal d'alarme ne seront pas effectués.
- Si un signal d'alarme est acheminé pendant une reprise automatique d'enregistrement, le mode enregistrement déclenché sur signal d'alarme est activé. Ensuite, si la cassette arrive en fin de ruban, la reprise automatique d'enregistrement s'effectue, mais l'enregistrement déclenché sur signal d'alarme est libéré.
- Si TAPE END du Menu 4 a été réglé sur REPEAT, sélectionner un autre paramètre que MANUAL pour DURATION.
- Si le fil d'alimentation s'est débranché de la prise secteur ou qu'il s'est produit une panne de courant, aucune opération ne sera reconnue pendant environ 30 secondes après que le courant est revenu, ceci afin de protéger le ruban.

Enregistrement déclenché sur signal d'alarme (enregistrement d'urgence)

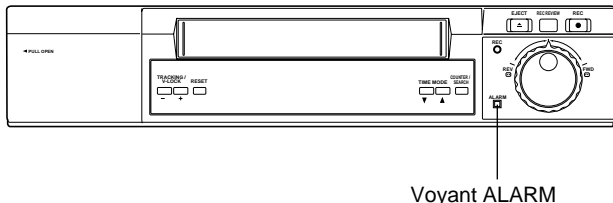
Lorsqu'une alarme se produit au site de surveillance pendant une surveillance prolongée et un enregistrement, la fonction d'alarme se déclenche automatiquement et l'enregistrement déclenché sur signal d'alarme s'effectue.

Principe de l'enregistrement déclenché sur signal d'alarme

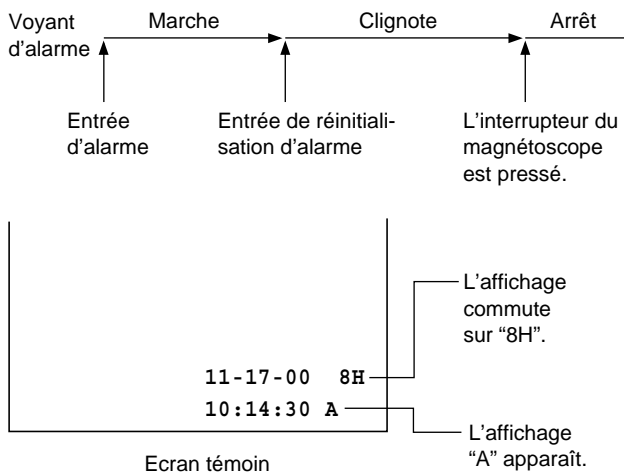


- Lorsqu'un signal d'alarme est acheminé via un détecteur d'alarme (commutateur de porte ou d'interphone, etc.) pendant un enregistrement en mode temps échelonné, la vitesse d'enregistrement commute en mode 8 heures, et les détails de l'état d'urgence sont fidèlement enregistrés.

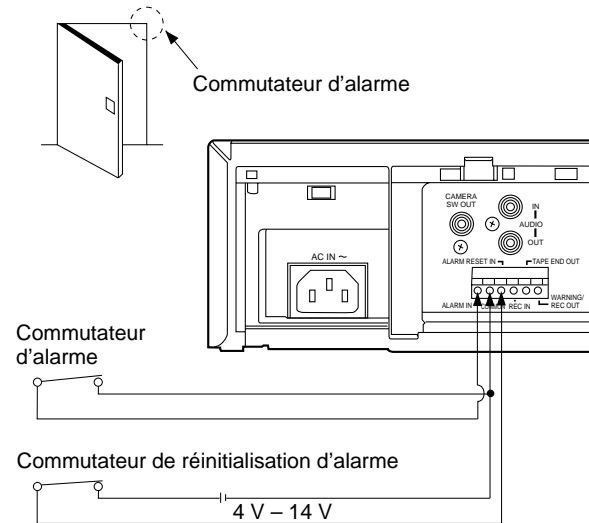
Méthodes d'alarme et d'affichage pendant un enregistrement déclenché sur signal d'alarme



- Lorsqu'un signal d'alarme est acheminé, le voyant d'alarme fonctionne comme suit.



Raccordement de la prise d'entrée d'alarme



- L'enregistrement déclenché sur signal d'alarme commence lorsque le commutateur d'alarme commute en position de marche. Lorsque le commutateur de réinitialisation d'alarme est placé à la position de marche (ON) une fois que l'enregistrement a commencé, l'enregistrement déclenché sur signal d'alarme est libéré et le fonctionnement revient au mode enregistrement par temps échelonné initial.
- Il est possible de libérer l'enregistrement déclenché sur signal d'alarme en appuyant sur la touche arrêt (STOP) pendant un enregistrement déclenché sur signal d'alarme. Toutefois, il ne sera pas possible de le libérer en appuyant sur la touche arrêt si le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) est placé à la position REC LOCK ou si le voyant INT est allumé au registre.
- Il est possible de réinitialiser automatiquement l'enregistrement déclenché sur signal d'alarme sans envoyer de signal d'entrée de réinitialisation d'alarme. Le temps de réinitialisation pourra être réglé sur 0,5, 1, 2, 3, 5 ou 10 minutes.
- Il existe une autre possibilité, qui est l'enregistrement déclenché sur signal d'alarme uniquement pendant l'acheminement du signal d'entrée d'alarme.
- L'enregistrement déclenché sur signal d'alarme est possible jusqu'à la fin du ruban.
- Lorsque le mode d'alarme est réglé sur arrêt (OFF), l'enregistrement déclenché sur signal d'alarme n'est pas possible même si le commutateur d'alarme est réglé sur marche (ON).

Enregistrement déclenché sur signal d'alarme (enregistrement d'urgence)

Procédure d'enregistrement déclenché sur signal d'alarme

- 1 Vérifier qu'il y a une cassette, avec sa languette intacte, dans l'appareil.
- 2 Placer le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) à la position MENU pour afficher les menus.
Appuyer sur la touche page pour afficher l'écran de réglage d'enregistrement déclenché sur signal d'alarme (menu 3) à l'écran témoin.
- 4 Appuyer sur la touche décalage (▼) pour amener le clignotement sur DURATION. Appuyer sur la touche réglage (– ou +) pour régler la durée d'enregistrement.

DURATION : 30SEC

- 5 Lorsque les réglages sont terminés, placer le commutateur menu/verrouillage du mode enregistrement à la position OFF. L'écran normal revient.
- 6 Appuyer sur la touche enregistrement (REC). Ensuite, lorsqu'un signal d'entrée d'alarme est acheminé, le mode de temps réglé sur 8H, et l'enregistrement déclenché sur signal d'alarme se poursuit jusqu'à ce que l'alarme soit libérée.

```
[ALARM] P3
      MODE : OFF
      DURATION : 30SEC

[RECALL] -
          -
          -
```

- 3 Appuyer sur la touche réglage (– ou +) pour afficher ALARM au paramètre MODE.

MODE : ALARM

- Si le paramètre TAPE END du menu 4 a été réglé à la position REPEAT, le mode reprise automatique d'enregistrement est activé lorsque la cassette arrive en fin de ruban. Pour effectuer un reprise automatique d'enregistrement, utiliser un paramètre d'intervalle d'enregistrement déclenché sur alarme autre que MANUAL.
- Pour l'enregistrement d'urgence, placer l'appareil en mode contact coupé ou arrêt.

Rappel des enregistrements sur alarme

Il est possible de voir à l'écran témoin l'heure à laquelle le signal d'alarme a été envoyé en vérifiant l'heure d'entrée de l'alarme au paramètre RECALL du menu 3.

- 1 Placer le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) à la position MENU pour afficher les menus.
Appuyer sur la touche page pour afficher l'écran de réglage d'enregistrement déclenché sur signal d'alarme (menu 3) à l'écran témoin.
- 2 Lorsque les réglages sont terminés, placer le commutateur menu/verrouillage du mode enregistrement à la position OFF. L'écran normal revient.

```
[ALARM] P3
      MODE : ALARM
      DURATION : 30SEC

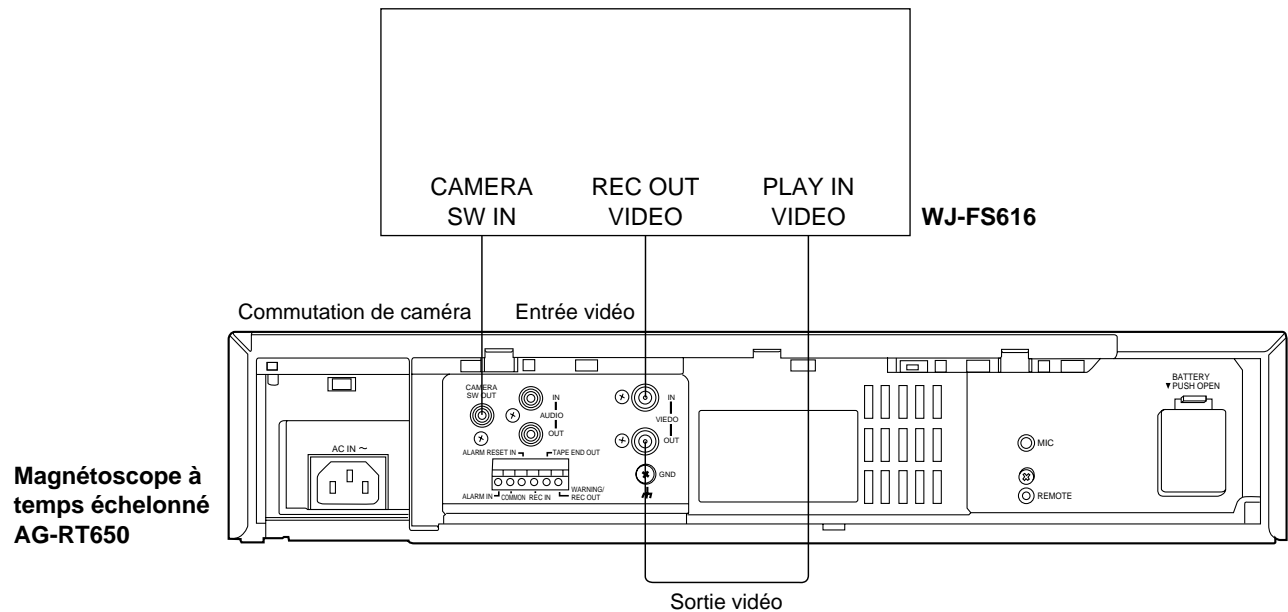
[RECALL] 10-10-01 20:19
          9-14-01 12:05
          8-30-01 08:40
          6-25-01 04:14

[OUTPUT SELECT]
      TERMINAL OUT : ERR WARN
```

- La fonction de rappel des enregistrements sur alarme peut mémoriser un maximum de 4 heures d'entrée d'alarme et les afficher à l'écran. S'il y a eu plus de 4 entrées, elles s'effaceront de l'écran dans l'ordre en commençant par les plus anciennes.
- Si une pression est exercée sur la touche réinitialisation (RESET) alors que le menu 3 est affiché, la mémoire de rappel des enregistrements sur alarme s'efface.

Raccordement et enregistrement d'un commutateur cyclique

Raccordements (à l'aide du WJ-FS616)

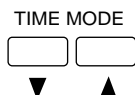


- Ne pas envoyer simultanément les signaux de caméras couleur et de caméras noir et blanc aux connecteurs d'entrée de caméra car cela perturberait la synchronisation de l'écran témoin ou engendrerait du bruit.
- Pendant la lecture, activer ou désactiver l'insertion Quasi-V avec la touche FWD ADV. Ceci permettra de réduire l'aspect des images d'autres caméras.

Procédure de lecture

Avant de procéder, vérifier que les voyants d'enregistrement programmé par minuterie interne/externe (INT/EXT) sont éteints au registre. (Si les voyants INT ou EXT sont affichés, les éteindre avec le commutateur mode de minuterie (TIMER MODE).)

- 1 Etablir le contact sur l'appareil et sur l'écran témoin.
- 2 Insérer la cassette enregistrée dans l'appareil.
- 3 Sélectionner le mode de temps.
- 4 Appuyer sur la touche lecture (PLAY).

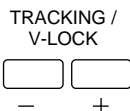


Remarques sur le fonctionnement

1. Noter les points suivants à la lecture de sections d'un ruban enregistré en mode temps échelonné (24 heures/40 heures).
 - Si le ruban est lu dans le même mode, des parasites ressemblant à des pailles apparaîtront à l'écran; ceci est normal.
 - L'image risque d'osciller en sens vertical; ceci est normal.
 - Si le ruban est lu dans le même mode de temps, l'image risque de bouger légèrement dans le sens latéral; ceci est normal.
 - Activer (ON) (⏮▶) ou désactiver (OFF) (▶) l'insertion Quasi-V avec la touche avance image par image (FWD ADV). Les sauts d'image pourront être réduits si le ruban est lu en mode temps échelonné (24 heures/40 heures). Néanmoins, la lecture d'une bande dans un système comprenant un commutateur cyclique permet de réduire l'aspect des images d'autres caméras.
2. Noter les points suivants à la lecture de sections d'un ruban enregistré en mode VHS (8 heures).
 - Si le ruban est lu en mode temps échelonné, de légers parasites risquent d'apparaître en haut et en bas de l'écran; ceci est normal.
3. Si des parasites apparaissent à l'écran lors d'un arrêt sur image, appuyer sur la touche avance image par image (FWD ADV) pour les dépasser. (Il ne sera pas toujours possible de supprimer le bruit.)
4. Noter que si le fil d'alimentation est débranché puis rebranché, ou si l'alimentation est rétablie après une panne d'alimentation alors que la lecture s'effectue avec le voyant EXT allumé au registre à l'aide de la touche mode de minuterie, l'appareil commutera automatiquement du mode lecture au mode enregistrement.
5. Si une pression est exercée sur la touche pause/arrêt sur image (PAUSE/STILL) pendant la lecture, l'appareil commute en mode pause et un arrêt sur image apparaît à l'écran témoin. Pour libérer cet état, appuyer à nouveau sur la touche pause/arrêt sur image, ou appuyer sur la touche lecture (PLAY). Si la pause est maintenue pendant plus de 5 minutes, l'appareil commute en mode arrêt.
6. Si le réglage AFC horizontal de l'écran témoin est trop long, ou si la caméra vidéo utilisée est de type à balayage entrelacé sélectif, le haut de l'écran témoin risque d'être déformé; ceci est normal.
7. Un ruban enregistré en mode 2 heures sur un autre magnétoscope pourra être lu en mode 2 heures. Toutefois, il ne pourra pas être lu en mode 24 heures ou 40 heures.
 - "8H" apparaît à la lecture d'un ruban enregistré pour 6 heures sur un autre magnétoscope.
8. Les cassettes enregistrées sur cet appareil ne pourront pas être lues sur d'autres appareils vidéo VHS car elles ne sont pas compatibles.
9. Si le fil d'alimentation s'est débranché de la prise secteur ou qu'il s'est produit une panne de courant pendant une avance accélérée ou un rebobinage, aucune opération ne sera reconnue pendant environ 30 secondes après que le courant est revenu, ceci afin de protéger le ruban.

Pistage

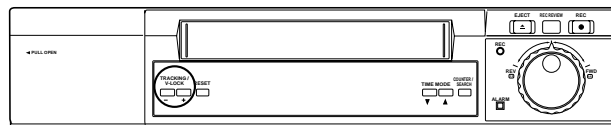
Lorsque des parasites, comme à l'écran ci-dessous, apparaissent à l'image de lecture en mode de temps 8 heures, appuyer sur la touche pistage (+ ou -) pour les réduire.



- Pour obtenir le réglage implicite du pistage, appuyer simultanément sur les touches "+" et "-" (en mode de temps 8 heures uniquement).
- En mode de temps 24 heures ou 40 heures, appuyer sur la touche "+" ou "-" pour régler le pistage.

Réglage de la stabilité verticale

Si l'image bouge légèrement dans le sens vertical pendant un arrêt sur image, appuyer sur les touches de blocage verticale (-, +) afin de réduire le sautiller.



- Si l'écran témoin possède une commande de stabilité verticale, régler également cette commande.

Guide de dépannage

Anomalies relatives à l'installation

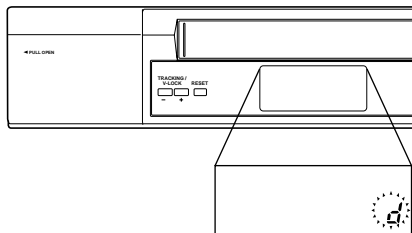
Pas d'alimentation.	• La fiche d'alimentation est-elle insérée à fond dans la prise secteur?
Pas d'image.	• L'appareil est-il correctement raccordé au téléviseur, aux caméras vidéo, etc.? • Y a-t-il un mauvais contact dans l'un des fils de raccordement?
L'image n'est pas nette.	• La mise au point des caméras vidéo est-elle réglée correctement?

Anomalies relatives aux fonctions ou au fonctionnement

Rien ne se produit lorsque les touches de fonction sont pressées.	• Y a-t-il une cassette vidéo dans l'appareil? • Le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) est-il placé à la position OFF? • La cassette vidéo est-elle insérée correctement? Appuyer sur la touche éjection (EJECT) pour éjecter la cassette et l'insérer correctement. • Le voyant INT est-il allumé au registre?
---	--

Le voyant "⏏" clignote.

- L'appareil ne fonctionnera pas car son circuit de protection est entré en service. Attendre que le voyant ait cessé de clignoter.



En cas de détection d'humidité:

Le voyant "⏏" clignote au registre.



L'éjection sera incomplète si une cassette vidéo a été insérée dans l'appareil.



Attendre que le voyant "⏏" se soit éteint, l'interrupteur du magnétoscope étant en contact ("ON"). Cela peut prendre quelques heures, bien que la durée varie avec les conditions.

Les données d'affichage de la date et de l'heure n'étaient pas mémorisées lors d'une panne d'alimentation.

- La fiche d'alimentation de l'appareil a-t-elle été débranchée de la prise secteur pendant longtemps?
Insérer la fiche d'alimentation de l'appareil dans la prise secteur et laisser l'appareil constamment branché pendant au moins trois jours.

Anomalies d'enregistrement

La lecture, l'avance accélérée et le rebobinage s'effectuent normalement, mais l'enregistrement est impossible.

- La languette de la cassette vidéo est-elle brisée?

L'enregistrement s'arrête.

- La cassette vidéo est-elle arrivée en fin de ruban?
- Cinq minutes se sont-elles écoulées depuis que la touche pause/arrêt sur image (PAUSE/STILL) a été pressée pendant l'enregistrement?
- Les vérifications périodiques sont-elles effectuées régulièrement?
Si ce phénomène continue de se reproduire, c'est qu'il y a un problème nécessitant une intervention. Consulter son détaillant.

Guide de dépannage

L'alimentation se rétablit après une panne d'alimentation, mais l'enregistrement ne reprend pas automatiquement.	<ul style="list-style-type: none">• La panne d'alimentation a-t-elle duré longtemps (plus d'une semaine)? Placer le commutateur d'enregistrement programmé à la position EXT pour garantir que l'appareil commute en mode enregistrement même après une panne d'alimentation prolongée.
Impossible d'arrêter l'enregistrement.	<ul style="list-style-type: none">• Commencer par mettre le commutateur menu/verrouillage du mode enregistrement (MENU/REC LOCK) sur OFF, puis faire fonctionner l'appareil.• Le commutateur menu/verrouillage du mode enregistrement du menu 1 est-il à la position OFF?
Impossible d'effectuer correctement un enregistrement programmé d'une semaine.	<ul style="list-style-type: none">• La date et l'heure des affichages normaux sont-elles exactes? (Voir page 12.)
L'une des caméras au moins n'enregistre pas lorsque le système fait intervenir plusieurs caméras.	<ul style="list-style-type: none">• Tourner la commande de réglage de temps du commutateur cyclique et la régler de façon que le temps soit supérieur à la durée d'enregistrement vidéo en mode temps d'enregistrement.• Raccorder un câble de commutation de caméras entre l'appareil et le commutateur cyclique. (Voir page 21.)
La reprise automatique d'enregistrement ne s'effectue pas.	<ul style="list-style-type: none">• La touche arrêt a-t-elle été pressée pendant un rebobinage automatique?
L'enregistrement programmé ne s'effectue pas.	<ul style="list-style-type: none">• L'heure du jour et les heures de début et d'arrêt de l'enregistrement programmé sont-elles exactes?• Le voyant INT ou EXT est-il affiché au registre?
L'enregistrement déclenché sur signal d'alarme ne s'effectue pas.	<ul style="list-style-type: none">• Les détecteurs d'alarme et les prises d'entrée d'alarme sont-ils raccordés correctement?• Le mode enregistrement déclenché sur signal d'alarme a-t-il été sélectionné au menu 3?

Anomalies de lecture

Des parasites apparaissent parfois à la lecture.	<ul style="list-style-type: none">• Régler les touches pistage. (Voir page 22.)
L'image de lecture renferme des poussières.	<ul style="list-style-type: none">• Les têtes vidéo sont peut-être sales ou encrassées, ou elles ont peut-être atteint leur limite de service. Consulter son détaillant.
De la "neige" apparaît à la lecture.	<ul style="list-style-type: none">• Les têtes vidéo sont peut-être sales ou encrassées. Consulter son détaillant.
A l'utilisation de plusieurs caméras, deux scènes apparaissent à la lecture lors de la commutation des caméras.	<ul style="list-style-type: none">• Le fil du signal de commutation des caméras est-il raccordé correctement?
L'enregistrement commence pendant le branchement ou le débranchement de la fiche d'alimentation de la prise secteur.	<ul style="list-style-type: none">• Le voyant INT ou EXT est-il affiché au registre?
Pas de lecture parce que l'enregistrement commence lorsque le contact est établi sur l'appareil relié.	<ul style="list-style-type: none">• Le voyant INT ou EXT est-il affiché au registre?

Données techniques

Alimentation: 120 V c.a., 50 – 60 Hz
Consommation: 20W

Système d'enregistrement

vidéo: Balayage hélicoïdal, 4 têtes d'enregistrement
Vitesse de défilement: 11,12 mm/s (mode 8 heures)
 3,71 mm/s (mode 24 heures)
 2,22 mm/s (mode 40 heures)
Ruban magnétoscopique: Largeur de ruban 12,7 mm, ruban **VHS**
Temps d'enregistrement: 8 heures (avec une cassette NV-T160, mode 8 heures)
Temps d'avance accélérée/rebobinage: Inférieure à 2,5 min (avec une cassette NV-T160)

VIDEO

Système de télévision: Norme EIA (525 lignes, 60 trames)
 Signal couleur NTSC
Système de modulation: Luminance: Enregistrement par modulation de fréquence
 Signal couleur: Enregistrement par déphasage de la sous-porteuse transposée
Entrée: Entrée vidéo (BNC); 1,0 V c.-à-c., 75 ohms, asymétrique
Sortie: Sortie vidéo (BNC); 1,0 V c.-à-c., 75 ohms, asymétrique
Définition horizontale: Couleur; Plus de 300 lignes
 Noir et blanc; Plus de 300 lignes
Rapport signal/bruit: Noir et blanc; Supérieur à 45 dB (Mode 8 heures, Détail invalidé)
 Couleur; Supérieur à 43 dB (Mode 8 heures, Détail invalidé)

AUDIO

Entrée: Entrée audio (Phono):
 –10 dBV, 47 kohms, asymétrique
 Microphone (mini-prise):
 –60 dBV, 600 ohms, asymétrique
Sortie: Sortie audio (Phono);
 –8 dBV, 1 kohm, asymétrique
Pistes: 1 piste (Normale)

Modes temps d'enregistrement/lecture:

Modes 8/24/40 heures

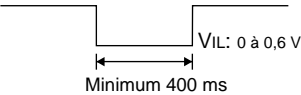
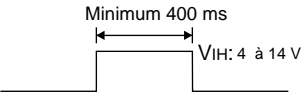
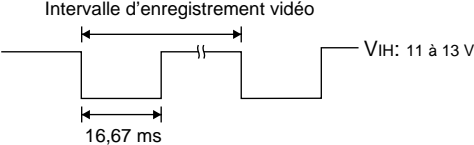
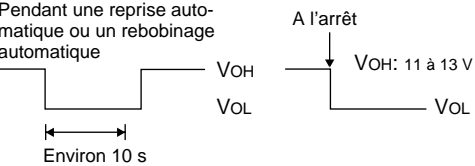
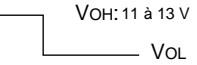
PRISES

Entrée d'alarme/entrée d'enregistrement: Fermeture du contact
Entrée de réinitialisation d'alarme: +4 V à +14 V

Température: 5°C à 40°C
Humidité: 35% à 80%
Poids: 3,8 kg
Dimensions: 430 × 88 × 293,5 mm

Les poids et les dimensions sont approximatifs.
 Les spécifications sont sujettes à modifications sans préavis.

Niveau de signal aux prises d'entrée/sortie

Prise	Niveau de signal	Remarque
Entrée d'alarme/entrée d'enregistrement		Entrée LOW
Entrée de réinitialisation d'alarme		Entrée HIGH
Sortie de commutation de caméra		VOH = 11 à 13 V (5,6 kΩ) VOL = 0 à 0,6 V (max. 3 mA)
Sortie de fin de ruban		VOH = 11 à 13 V (4,7 kΩ) VOL = 0 à 0,6 V (max. 3 mA)
Sortie de du signal d'avertissement		VOH = 11 à 13 V (4,7 kΩ) VOL = 0 à 0,6 V (max. 3 mA)

Panasonic Canada Inc.

5770 Ambler Drive, Mississauga, Ontario L4W 2T3 (905) 624-5010

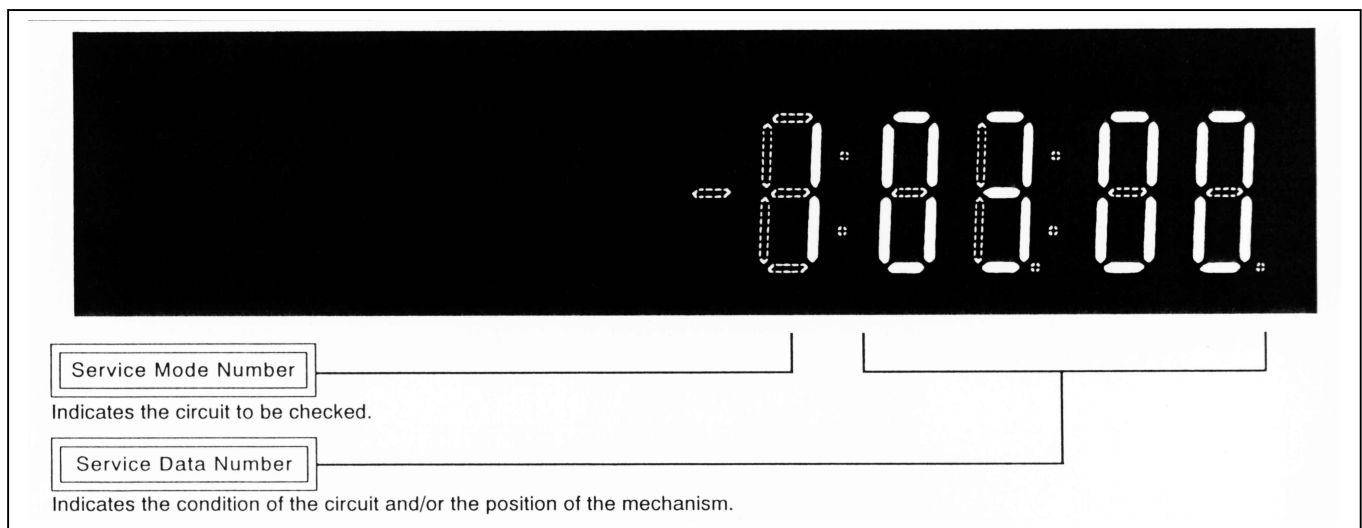
SECTION 2

SERVICE INFORMATION

CONTENTS

1. SERVICE INFORMATION DISPLAY	INF-1
1-1. Purpose of Service Information Display	INF-1
1-2. How to display Service Information	INF-1
1-3. Use of Service Modes	INF-1
2. AUTO OFF AND ERROR MESSAGE	INF-5
3. CHEKING OF MAIN C.B.A.	INF-6
4. REMOVAL OF CASSETTE TAPE	INF-6
4-1. Removal of compulsory loading	INF-6
4-2. Removal of manual operation of Main cam gear	INF-6
5. HOUR METER RESET	INF-6

1. SERVICE INFORMATION DISPLAY



1-1. Purpose of Service Information Display

This is information to aid trouble shooting by indicating the source of the malfunction. The service mode number & service data number are used by the technician for repair.

1-2. How to display Service Information

Press the FF and EJECT buttons simultaneously.

In the service Information display, there are five digit numbers divided into 3 functions.

The first digit indicates service mode that the unit is currently in.

MODE 1: Check tape protection circuit.

MODE 2: Check tape transport mechanism.

MODE 3: Indicate the most recent fault indication code.

MODE 4: Indicate the second recent fault indication code.

MODE 5: Indicate the third recent fault indication code.

MODE 6: Check cylinder motor and capstan motor.

MODE 7: Check loading/unloading mechanism action.

The second, third, fourth and fifth digits are service data 1 and 2 which indicate the condition of the circuit or mechanism.

1-3. Use of Service Modes

(1) Show Service Information Display.

(2) To change Service modes, press the FF and EJECT buttons simultaneously.

(3) Mode 0: Indicate VCR mode and process number

(4) Mode 1:

Service Data 1: Checks the sensor LED, Supply & Take-up sensor circuits by blocking the light from the sensor LED to either or both Supply & Take-up sensor.

When the light is blocked to both sensors, "00" should be indicated on the service data number.

When the light is blocked to the supply sensor, "01" should be indicated.

Service Data 2: Indicate the code if the microprocessor receives the operating commands from the mode buttons and/or remote controller.

(5) Mode 2:

Service Data 1: Check the mode switch circuit while indicating mechanism position.

Service Data numbers indicate the position of the mode switch as the mechanism position.

Service Data 2: Indicate control command to cylinder unit, capstan unit and loading motor unit.

(6) Mode 3:

Service Data 1: The most recent fault indication code is displayed.

Service Data 2: Indicate complementary data (VCR mode, mechanism position and so on) for the most recent fault indication code.

(7) Mode 4:

Service Data 1: The second recent fault indication code is displayed.

Service Data 2: Indicate complementary data (VCR mode, mechanism position and so on) for the most recent fault indication code.

(8) Mode 5:

Service Data 1: The third recent fault indication code is displayed.

Service Data 2: Indicate complementary data (VCR mode, mechanism position and so on) for the most recent fault indication code.

(9) Mode 6:

Service Data 1: Check cylinder motor circuit.

Indicate if the system control IC has received the command to rotate the cylinder motor.

Service Data 2: Check capstan motor circuit.

Indicate if the system control IC has received the command to rotate the cylinder motor.

(10) Mode 7: Check the loading/unloading mechanism action.

The loading motor rotates for loading when the "PLAY" button is pressed.

The loading motor rotates for unloading when the "STOP" button is pressed.

This mode can be displayed until the POWER button is pressed.

Service Mode Number	Note for checking Service Data Numbers	Service Data 1		Service Data 2		Remarks
		Service Data Numbers	Indication	Service Data Numbers	Indication	
1	Service Data 1: For checking supply/ Take-up photo sensor. Service Data 2: For checking operating button.	00	No light detected at either sensor	-----	Display only when the operating button is pressed.	Tape not required.
		01	Tape beginning Light to Supply photo sensor is blocked.			
		02	Tape end Light to Take-up photo sensor is blocked.			
		03	Light detected at both sensors.			
2	Service Data 1: For checking mechanism mode position. Service Data 2: For checking cylinder, capstan and loading motor.	00	EJECT	0*, 2*	Cylinder OFF, Capstan OFF	Tape required. *1. STOP3: Pinch roller is on Capstan motor shaft. *2. STOP: Pinch roller is off Capstan motor shaft. To enable mechanism operation without cassette tape, the following detection is not worked. -supply and Take-up sensor. -Reel lock. -Distinction and position of tape.
		01	Cassete down	1*	Cylinder OFF, Capstan ON (FWD)	
		02	REV, REV SLO	3*	Cylinder OFF, Capstan ON (RVS)	
		03	Loading/Unloading	8*, A*	Cylinder ON, Capstan OFF	
		04	PLAY, REC, STILL, PAUSE, CUE FWD SLOW, STOP3*1	9*	Cylinder ON, Capstan ON (FWD)	
		05	STOP*2	B*	Cylinder ON, Capstan ON (RVS)	
		06	FF/REW	*0	Mode OFF	
		07	Intermediated position	*1	Loading	
3	Service Data 1: Indicates the most recent fault indication code (Self-test indication display). Service Data 2: Indicates complementary data (VCR mode, mechanism position mode and so on) for fault indication code.	10	Dew formation.	8	* Left digit Right digit	Left digit: Indicates VCR mode. 0:STOP, 1:EJECT, 2:REW, 3:FF, 4:REV, 5:CUE, 6:SLOW, 7:POWER OFF, 8:PLAY, 9:STILL, A:REC, B:REC PAUSE, C:ADUB, D:ADUB PAUSE, E:INSERT, F:INSERT PAUSE
		11	Cylinder clogs during PLAY mode.			
		01	After cylinder lock is detected, the cylinder does not start rotating again even after tape unloading.		* Left digit Right digit	Right digit: Tape position, waiting mode position and supply reel pulse counting value are indicated. Fault indication number 03, 04, 06: Indicates waiting mechanism position. Fault indication number 05, 16, 17, 18: Indicates tape position that is indicated in hexadecimal. Fault indication number 15: Indicates supply reel pulse counting value. The other fault indication codes :No display.
		02	Cassette tape is not wound up during tape unloading except EJECT mode.			
		03	Mechanism locks during mode transition except EJECT mode.			
		04	Mechanism locks during tape loading.			
		05	Cassette tape is not wound up during tape unloading in EJECT mode.			
		06	Mechanism locks after tape unloading in EJECT mode.			
		07	During recording mode recording signal is less than the normal condition.			
		08	Recording circuit works except recording mode.			
		15	Tape is not loading in cassette in mode.			
		16	Cylinder lock detection.			
		17	Supply reel mechanism lock detection.			
		18	Take-up reel mechanism lock detection.			
		2*	PG shifter automatic adjustment error.			

Service Mode Number	Note for checking Service Data Numbers	Service Data 1		Service Data 2		Remarks
		Service Data Numbers	Indication	Service Data Numbers	Indication	
4	Service Data 1: Indicate the second recent fault indication code (Self-test indication display). Service Data 2: Indicate complementary data (VCR mode, mechanism position mode and so on) for fault indication code.	10	Dew formation	8 Left digit	* Right digit	Left digit: Indicates VCR mode. 0:STOP, 1:EJECT, 2:REW, 3:FF, 4:REV, 5:CUE, 6:SLOW, 7:POWER OFF, 8:PLAY, 9:STILL, A:REC, B:REC PAUSE, C:ADUB, D:ADUB PAUSE, E:INSERT, F:INSERT PAUSE Right digit: Tape position, waiting mode position and supply reel pulse counting value are indicated. Fault indication number 03, 04, 06: Indicates waiting mechanism position. Fault indication number 05, 16, 17, 18: Indicates tape position that is indicated in hexadecimal. Fault indication number 15: Indicates supply reel pulse counting value. The other fault indication codes :No display.
		11	Cylinder clogs during PLAY mode.			
		01	After cylinder lock is detected, the cylinder does not start rotating again even after tape unloading.			
		02	Cassette tape is not wound up during tape unloading except EJECT mode.			
		03	Mechanism locks during mode transition except EJECT mode.	* Left digit	0 Right digit	
		04	Mechanism locks during tape loading.			
5	Service Data 1: Indicate the third recent fault indication code (Self-test indication display). Service Data 2: Indicate complementary data (VCR mode, mechanism position mode and so on) for fault indication code.	05	Cassette tape is not wound up during tape unloading in EJECT mode.			
		06	Mechanism locks after tape unloading in EJECT mode.			
		07	During recording mode recording signal is less than the normal condition.			
		08	Recording circuit works except recording mode.			
		15	Tape is not loading in cassette in mode.			
		16	Cylinder lock detection.			
		17	Supply reel mechanism lock detection.			
		18	Take-up reel mechanism lock detection.			
6	Service Data 1: For checking cylinder unit. Service Data 2: For checking capstan unit. Left digit only, disregard right digit display.	1 Left digit	0 Right digit	8 Left digit	1 Right digit	Tape required. If a symbol other than those listed is displayed, a malfunction in that circuit is indicated.
	Service Data 1: Not used. Service Data 2: For checking capstan unit. Right digit only, disregard left digit display.	-----	-----	8 Left digit	7 Right digit	
	Service Data 1: Not used. Service Data 2: For checking capstan unit. Right digit only, disregard left digit display.	-----	-----	8 Left digit	- Right digit	
7	Same as mode 2.	Same as Mode 2.		Same as Mode 2.		

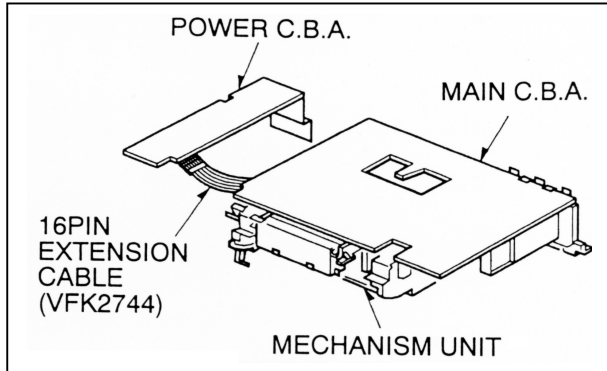
2. AUTO OFF AND ERROR MESSAGE

ERROR CODE	CONTENS	CAUSE CONDITION
d	CONDENSATION (DEW)	<ol style="list-style-type: none"> 1. If it is in POWER OFF mode, the mode turns to POWER ON and "d" blink indication. 2. If a tape is inserted, the mode turns to half EJECT position and cylinder rotates. 3. Dew condensation continues for about 80 minutes. 4. After released from condensation, if a tape is inserted, the mode turns to STOP.
E-2	FRONT LOADING LOCKED	<ol style="list-style-type: none"> 1. If the motor is locked for about 2-5 seconds during front loading, it is unloaded. 2. After above item1 if it is locked for about 2-5 seconds again, the mode turns to AUTO OFF and "E-2" indication.
E-3	LOADING LOCKED	<ol style="list-style-type: none"> 1. If the motor is locked for about 5 seconds during loading, it is unloaded. Then if it is loaded and locked again, the mode turns to AUTO OFF and "E-3" indication. 2. If the motor is locked for about 2-5 seconds during unloading, the mode turns to AUTO OFF and "E-3" indication.
E-4	CYLINDER LOCKED	<ol style="list-style-type: none"> 1. If the motor is locked for about 5 seconds in cylinder rotating mode, the mode turns to AUTO OFF and "E-4" indication.
E-5	REEL LOCKED	<ol style="list-style-type: none"> 1. If the reel rotation is locked during tape running, the motor in unloaded once. Then if the rotation is locked through the trying to load, the mode turns to AUTO OFF and "E-5" indication.

NTSC				PAL			
T-MODE	MODE	TAPE SPEED	DET. TIME	T-MODE	MODE	TAPE SPEED	DET. TIME
	PLAY	± 1	3.5S		PLAY	± 1	3.5S
8H	CUE/REV	± 2.5	1.6S	3H	CUE/REV	± 2.5	1.6S
	CUE/REV	$\pm 11,21,27$	0.3S		CUE/REV	$\pm 7,9,11$	0.3S
24H	PLAY	± 1	21S		PLAY	± 1	3.5S
40H	PLAY	± 1	42S	6H	CUE/REV	± 2.5	1.6S
					CUE/REV	$\pm 11,15,17,19$	0.3S
				12H	PLAY	± 1	21S
				24H	PLAY	± 1	42S

3. CHECKING OF MAIN C.B.A.

When Servicing the MAIN C.B.A., take out the MAIN C.B.A. and mechanism from the frame and turn over, and then connect Extension Cable (VFK2744) between the POWER C.B.A. connector and the MAIN C.B.A. connector as shown in below.



4. REMOVAL OF CASSETTE TAPE

There are 2 ways to remove a cassette tape.

4-1. Removal of compulsory loading.

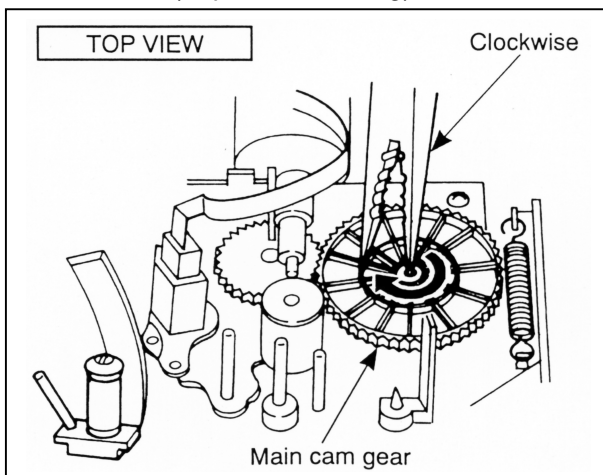
- 1) Press FF and EJECT buttons simultaneously and set the service mode 7.
- 2) Press STOP button in order to unload the mechanism
(Pay an attention to tape slack)

Service Mode Indication:

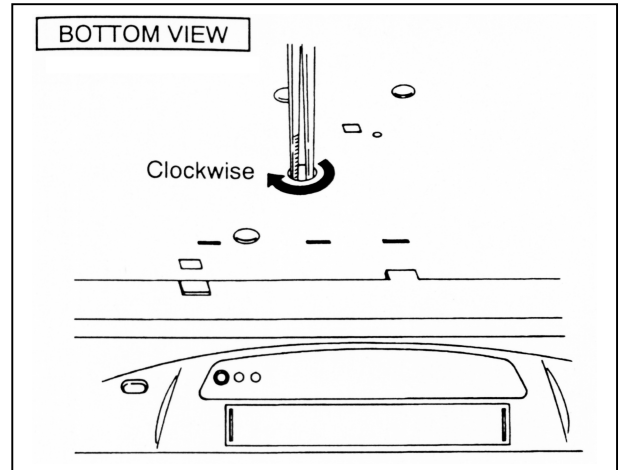
7 ※ ※ ※ ※ (STOP)→7 00 ※ ※ (EJECT)

4-2. Removal of manual operation of Main cam gear.

- 1) Disconnect the AC power cord and remove Top Panel.
- 2) Rotate Main cam gear clockwise and unload the mechanism (Tape as remaining)



- 3) Rotate the Pole of Capstan motor to the clockwise the from the bottom in order to remove the tape slack.



- 4) Rotate Main cam gear clockwise in order to eject the cassette tape.

5. HOUR METER RESET

1. Turn OFF power.
2. Connect the jumper wire between TP6902 and TP6901 on the Rear Jack C.B.A.
3. Set the MENU/REC LOCK switch to REC LOCK side.
4. Pressing the TRACKING and TRACKING buttons simultaneously, then turn ON power.
5. Confirm the Time display starts to blink.
6. The hour meter reset function is completed when stop the display blinking.

SECTION 3

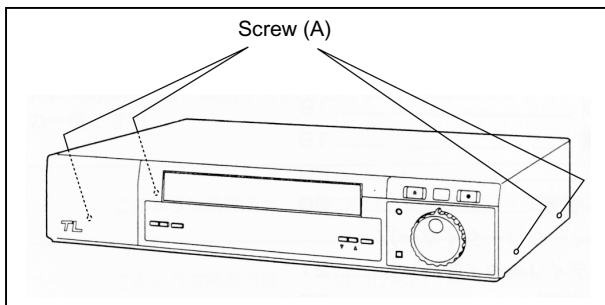
DISASSEMBLY PROCEDURES

CONTENTS

1.	Removal of The Top Cover	DIS-1
2.	Removal of The Front Panel	DIS-1
3.	Removal of The Power Supply C.B.A.....	DIS-1
4.	Removal of The Front R C.B.A.....	DIS-1
5.	Removal of The Front L C.B.A.	DIS-2
6.	Removal of The YC SEP C.B.A. (AG-RT650 only)	DIS-2
7.	Removal of Mechanism Unit and Main C.B.A.	DIS-2
8.	Removal of The Rear Jack C.B.A.....	DIS-3

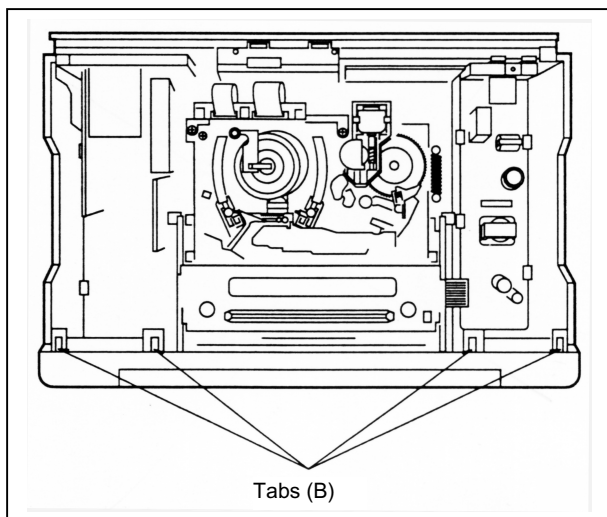
1. Removal of The Top Cover

1. Remove 4 screws (A) at left & right side.
2. Lift up rear portion and remove it.

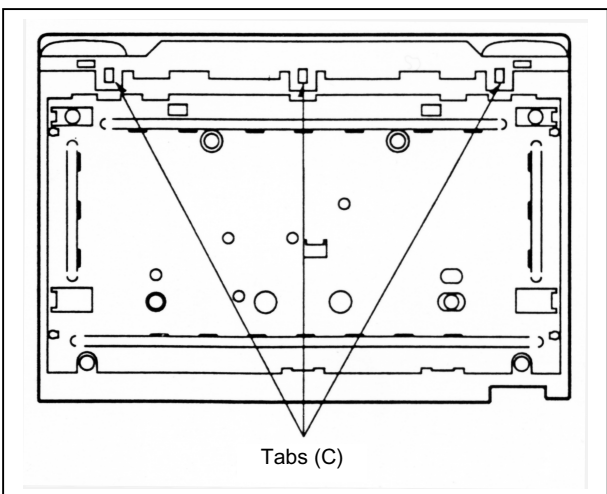


2. Removal of The Front Panel

1. Remove the Top Cover
2. Pull out the JOG dial knob to front direction. (AG-RT650 only)
3. Unlock 4 tabs (B) at top side.

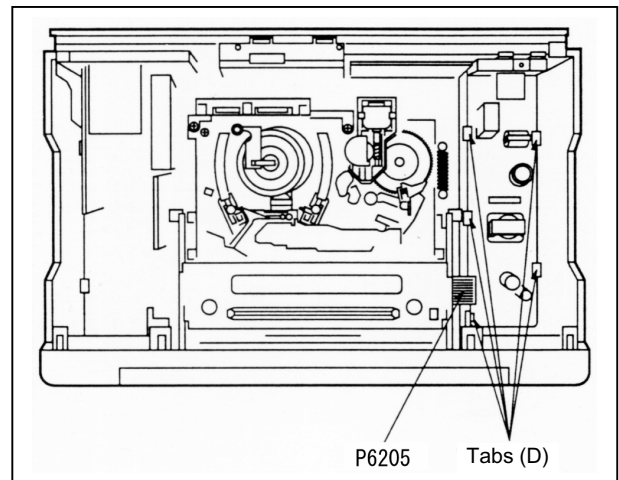


4. Unlock 3 tabs (C) at bottom side and remove it.



3. Removal of The Power Supply C.B.A.

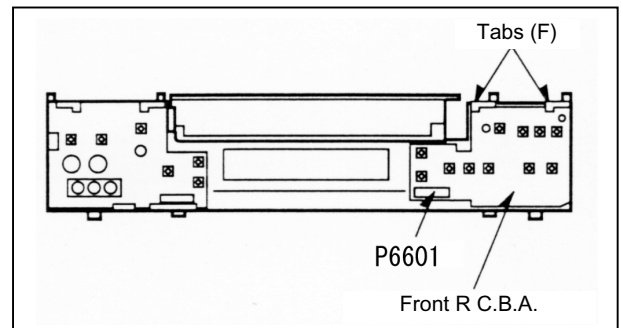
1. Remove the top Cover & the Front Panel.
2. Disconnect the Bridge connector (P6205)
3. Unlock 4 tabs (D)



4. Lift up the metal angle at rear portion and remove it.

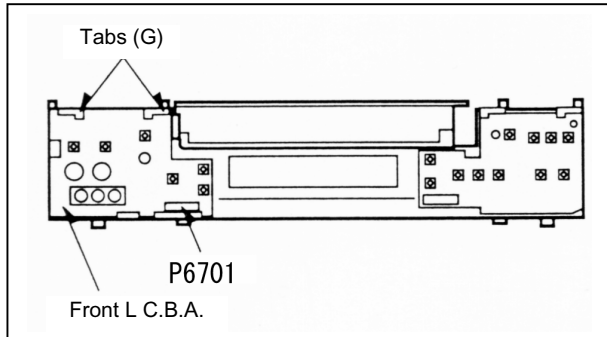
4. Removal of The Front R C.B.A.

1. Remove the top cover & Front Panel.
2. Unlock 2 tabs (F)
3. Disconnect a connector (P6601) from the Main C.B.A..



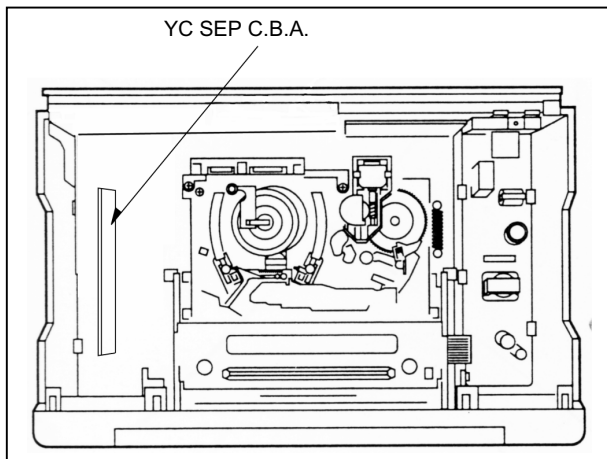
5. Removal of The Front L C.B.A..

1. Remove the top cover & Front Panel.
2. Unlock 2 tabs (G)
3. Disconnect a connector (P6701) from the Main C.B.A..



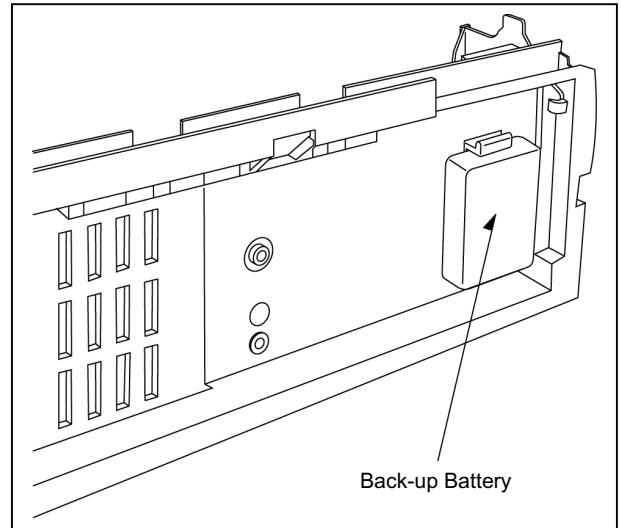
6. Removal of The YC SEP C.B.A.. (AG-RT650 only)

1. Remove the top cover & Front Panel.
2. Pull out the YC SEP C.B.A..

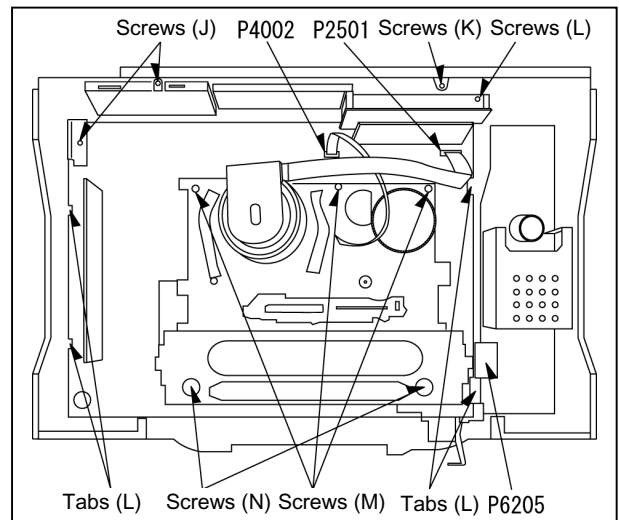


7. Removal of Mechanism Unit and Main C.B.A..

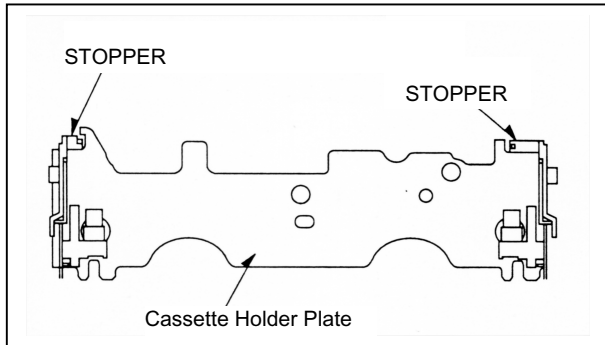
1. Remove the top cover & Front Panel.
2. Disconnect a connector (P6204) and remove the Back-up Battery.



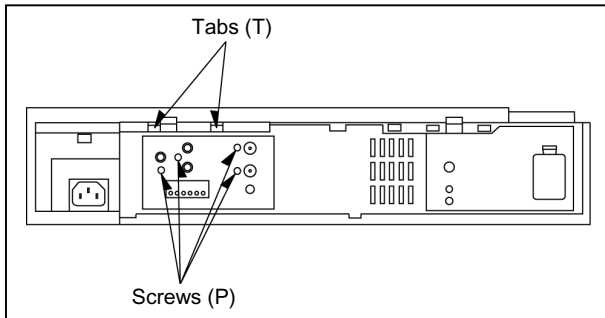
3. Disconnect the connector (P6205, P4002 and P2501).
4. Remove 2 screws (J), 3 screws (M), screw (K) and screw (L).



5. Keeping pressing 2 stoppers on the Cassette Holder Plate and press the Cassette Holder Plate to rear and remove 2 screws (N).

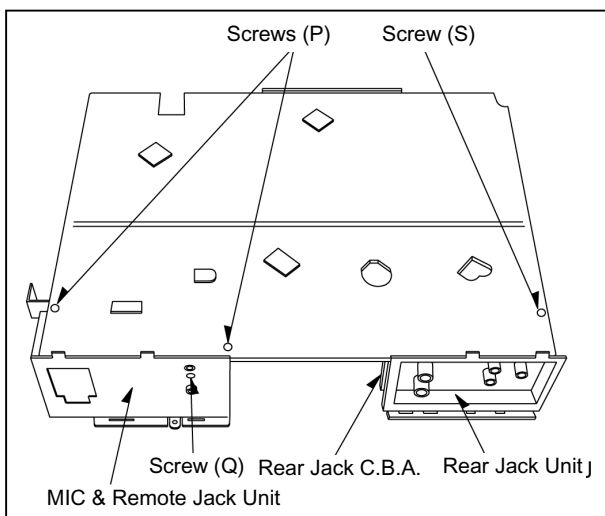


6. Remove 3 screws, then press the Earth Plate to rear.
7. Carefully lift up the Mechanism unit.
8. Unlock 4 tabs (L) and 2 tabs (T), then lift up the Main C.B.A and the both Rear Jack C.B.A..



8. Removal of The Rear Jack C.B.A.

1. Loosen a screw (Q) and remove 2 screws (R), then remove the MIC & Remote Jack unit from the Main C.B.A..

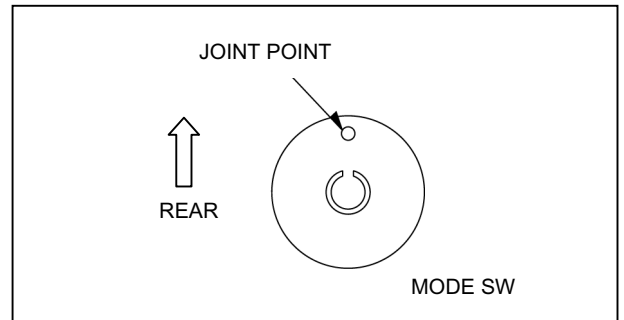


2. Remove a screw (S) and remove the Rear Jack unit from the Main C.B.A..

3. Remove 4 screws (P) and remove the Rear Jack C.B.A. from the Rear jack unit.

Note: Installation method of the Mechanism Unit.

- Confirm the MODE switch position as following figure.



- Make sure fit the CYLINDER cable, Loading Motor connector, FE Head connector, MODE switch and Supply & Take-up Photo unit on the Main C.B.A. to the Mechanism unit.

SECTION 4

MAINTENANCE AND MECHANISM

CONTENTS

MAINTENANCE

- 1. REGULAR MAINTENANCE MEC-1
- 2. CYLINDER UNIT REPLACEMENT MEC-2

MECHANICAL ADJUSTMENT INFORMATION

- 1. TEST POINT..... MEC-4
- 2. SPECIFICATION MEC-4

Maintenance

1. REGULAR MAINTENANCE

The purpose of periodic maintenance is to preserve the functioning of this machine throughout its useful life. The user or service dealer should perform these maintenance regularly to ensure that maximum utility is obtained from the machine.

The VCR is a complicated place of equipment. It contains many belts, rollers, heads etc., which become worn, and deteriorate as time goes by, causing trouble. Dust and dirt will also impede the proper functioning of the machine. In light of this, it is very important that overall maintenance is done according to the maintenance chart to maintain the functions of the VCR, and to avoid accidental problems. This maintenance should also be performed after any repairs are done on the equipment.

The VCR used for business applications requires particular attention for several reasons. The installation conditions and applications are not always the best. Long use times, or poor environmental conditions may adversely affect the lifespan and performance of the machine. Regular maintenance assures that the purchaser obtains the maximum value for his expenditure. Accordingly, the necessity of regular maintenance should be fully explained at the time of sale, as well as during after-sale repairs.

1-2. MAINTENANCE CHART

The following periodic maintenance is required to prolong the life of the machine. (24H mode operation)

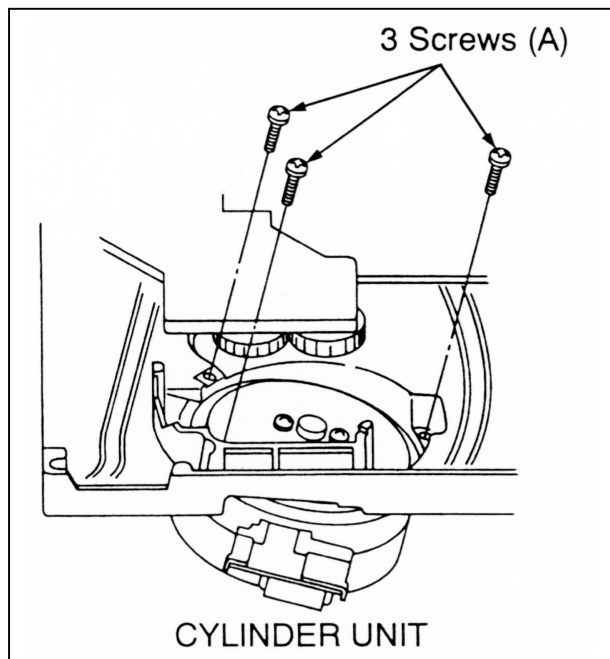
Parts Name	HOUR									
	500	1000	1500	2000	2500	3000	3500	4000	8000	12000
Tape Transporters	●	●	●	●	●	●	●	●	●	●
Upper Cylinder U	●	●	●	●	●	●	●	◎	◎	—
Cylinder U	●	●	●	●	●	●	●	●	●	◎
Capstan U	●	●	●	●	●	●	●	◎	◎	◎
FE HEAD	●	●	●	●	●	●	●	●	●	◎
A/C Head U	●	●	●	●	●	●	●	●	●	◎
Supply & Take Up Reel Table	●	●	●	●	●	●	●	●	●	△
Capstan Belt	●	●	●	●	●	●	●	◎	◎	◎
Loading motor U										◎
Brake Arm U										◎
Cleaner Arm U								◎	◎	◎
Tension Arm U										◎
Pinch Arm U								◎	◎	◎
Inclined Base (S) U										◎■
Inclined Base (T) U										◎■
Main Cam gear										◎□
Mode SW										◎
Detection SW										◎
Earth Plate										◎
P5 Arm U										◎
Center Clutch										◎
Idra arm U										◎
Convent Gear										◎

Symbol	Maintenace	Requirement	Remark
●	Cleaning	Ethyl-alcohol or Ceaning Liquid (Purchase locally)	Wipe dirt from the parts using soft cloth impregnated with Etyl-Alcohol. Note: When cleaning rubber parts, avoid using excessive alcohol since it may accelerate deterioration of these parts. After cleaning with alcohol, wipe the alcohol quickly and thoroughly.
◎	Replacement	-----	-----
△	Lubication	High Quality spindle Oil (VFK0131)	Supply one or two drops of oil.
■	Greasing	Molytone Grease (MOR265)	Wipe the old grease and apply new grease.
□	Greasing	Foil Grease (VFK1298)	Wipe the old grease and apply new grease.

2. CYLINDER UNIT REPLACEMENT

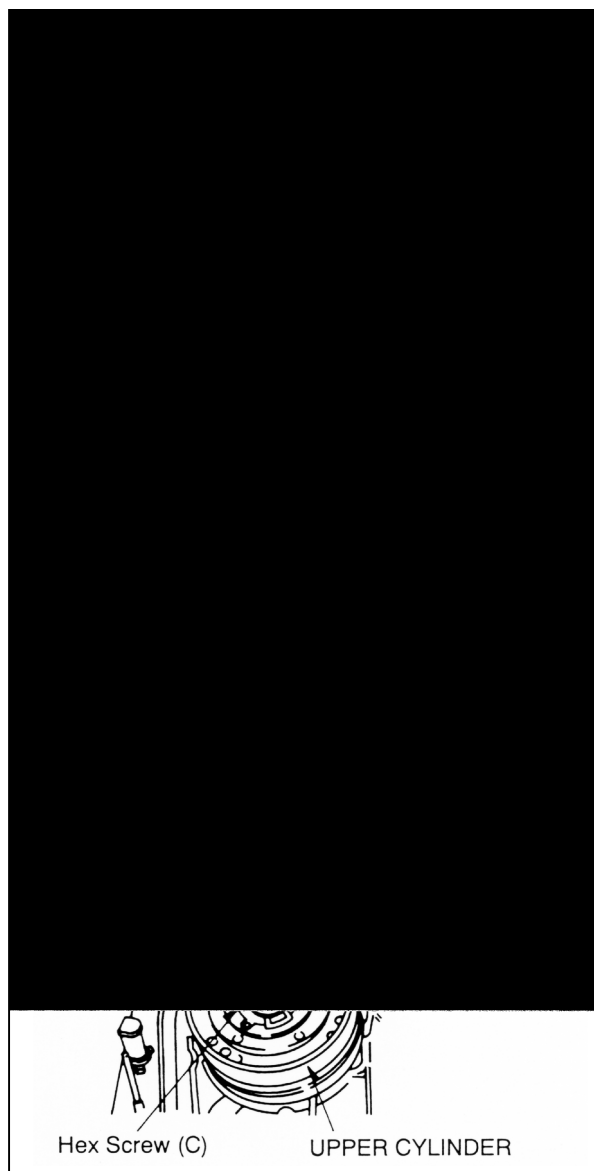
A. CYLINDER UNIT REPLACEMENT

Remove the 3 Screws (A) of the CYLINDER UNIT with a magnetized screw driver.



B. UPPER CYLINDER DISASSEMBLY

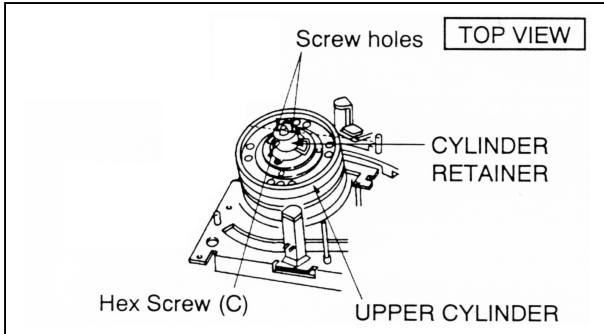
1. Remove 2 screws (A).
2. Remove the Cylinder Stator Unit.
3. Remove 2 screws (B).
4. Remove the Cylinder Rotor Unit.
5. Loosen hex screw (C) and remove the Cylinder Retainer. (Use Hex. Key Wrench 1.5 mm)
6. Remove the Upper Cylinder.



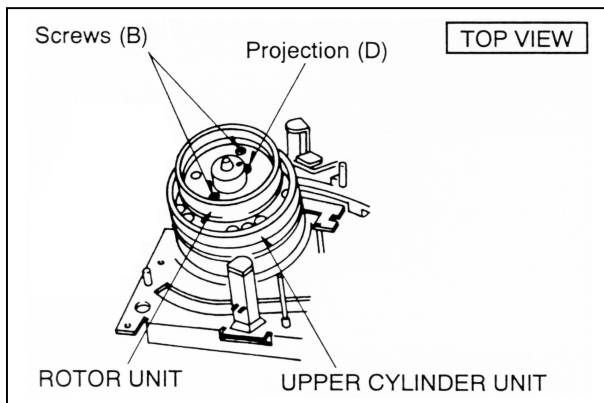
C. UPPER CYLINDER ASSEMBLY

For reassembling, perform the steps in the reverse order.

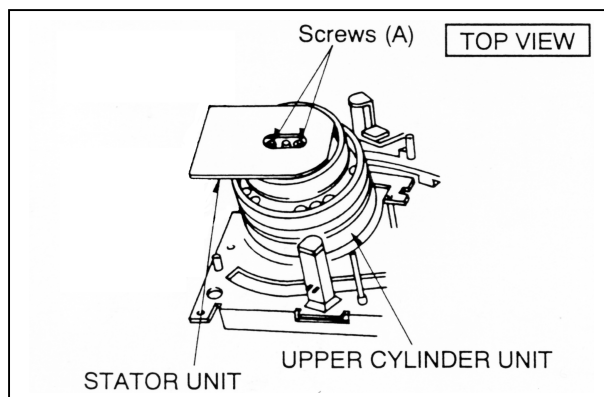
- 1) Install the Cylinder Retainer so that the 2 holes on top of the cylinder retainer are at right angles.
- 2) Tighten the hex screw (C) while pressing down on top of the Cylinder Retainer. (Use Hex. Wrench 1.5 mm)



- 3) Install the Cylinder Rotor Unit so that the inner hole of the Cylinder rotor Unit to the small projection (D) on top of the Upper Cylinder.
- 4) Tighten 2 screws (B).



- 5) Install the Cylinder Stator Unit.
- 6) Tighten 2 screws (A).



- 7) Confirm the PG SHIFTER ADJUSTMENT with the alignment tape (NTSC: VFM8080HQFP) and adjust it if necessary.

MECHANICAL ADJUSTMENT INFORMATION

This section contains the supplementary information of Mechanical Adjustment Procedure for Z-Mechanism. Please refer to the Z-Mechanism service manual (Order No. VSD9706M201, VRD9802005C2)

1. TEST POINT

INTERCHANGEABILITY ADJUSTMENT	VIDEO RF SIGNAL	TP3001 MAIN C.B.A.
	HEAD SWITCHING PULSE	TP6905 REAR JACK

2. SPECIFICATION

BACK TENSION	22.5 ~ 27.5g
--------------	--------------

SECTION 5

ELECTRICAL ADJUSTMENT

CONTENTS

Special Adjustment Procedures for the early products	EAD-1
1.PG Shifter Adjustment	EAD-2
2.Slow Free Run Adjustment	EAD-2
3.E-E Level Adjustment.....	EAD-2

Special Adjustment Procedures for the early products

Following adjustment procedures is necessary for early products.

(This procedure should be necessary until the new program is introduced to the Microprocessor of the FRONT circuit. The detail information of it will be announced in the Supplement Service manual later.)

Take notes of the Menu setting items.



Power OFF the unit, and connect a jumper wire between TP6902 and TP6901 on the Rear Jack C.B.A.



Perform the Slow Free Run Adjustment.(Refer to procedure)



Perform the PG Shifter Adjustment.(Refer to procedure)

- ① During PG Shifter adjustment, disconnect the power cable from AC outlet within 1 to 4 seconds after the picture color changed to black screen from blue screen on the Monitor.
- ② Connect the oscilloscope to TP6504 (Located on VR3001 pattern of the Main C.B.A.), then confirm the pulse appears about 5 seconds after power cable is connected to AC outlet.
- ③ If pulse appear less then second (about 0.1sec), repeat the PG Shifter adjustment.



Setting of Video Freq. Response Value

- ① At STOP mode, press the Tracking (+),(-) and Counter keys simultaneously to set the Adj_1 mode.
- ② Playback the Alignment tape, then press the F.ADV or R.ADV key to set "0101" as display on the LCD counter.

To next paragraph

(Continue to setting of Video Freq. Response Value)

- ③ Return to STOP mode, press the Tracking (+),(-) and Counter keys simultaneously to set the Adj_2 mode.
- ④ Playback the Alignment tape, then press the F.ADV or R.ADV key to set following value as display on the LCD counter.
AG-RT650 : 11
AG-TL350 : 49
- ⑤ Return to STOP mode again, press the Tracking (+),(-) and Counter keys simultaneously to return to the Normal mode.



Initialization of Menu setting (1) Service mode

- ① Press the Power button to turn OFF the unit.
- ② Set REC_LOCK switch to "REC_LOCK" position.
- ③ Pressing FF and REW buttons together, press the Power button to keep holding until stop blinking of Clock display on the LCD counter.

*Reset the Hour meter information too.



Initialization of Menu setting(2) Normal mode

- ① Press the Power button to turn OFF the unit and disconnect a jumper from the Rear Jack C.B.A..
- ② Set REC_LOCK switch to "REC_LOCK" position.
- ③ Pressing FF and REW buttons together, press the Power button to keep holding until stop blinking of Clock display on the LCD counter.



Re-set Main menu according to notes of first step in this procedures.



Exist

1. PG Shifter Adjustment

1. Turn OFF power.
2. Connect the jumper wire between TP6902 and TP6901 on the Rear Jack C.B.A..
3. Turn ON power.
4. Insert the Alignment Tape (NTSC: VFM8080HQFP, PAL: VFM8180HADH: 3rd portion)
5. Confirm the unit is in STOP mode, then press the TRACKING , and TIME MODE ▼ buttons simultaneously.
6. Place the unit into automatic adjustment mode after the unit goes to PLAY mode.
7. When the adjustment is completed, the unit goes to STOP mode.
8. When this adjustment is terminated (keep PLAY mode), the following code appear on the FLP display.

CODE	Contents
F1	CYLINDER rotation is unstable during adjustment mode.
F2	No synchronized signal up to 5 sec during adjustment mode.
F3	Not specified for fixed position of the CYLINDER.
F4	Servo not locked up to 10 sec during adjustment mode.

Note: Do not press any key during adjustment.

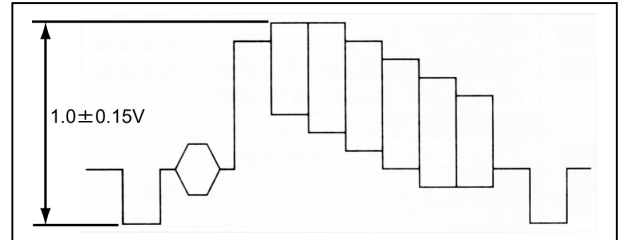
2. Slow Free Run Adjustment

1. Turn OFF power.
2. Connect the jumper wire between TP6902 and TP6901 on the Rear Jack C.B.A..
3. Turn ON power
4. Insert the Alignment Tape (NTSC: VFM8080HQFP, PAL: VFM8180HADH: 3rd portion)
5. Confirm the unit is in STOP mode, then press the TRACKING , and TIME MODE ▲ buttons simultaneously.
6. Place the unit into automatic adjustment mode, after the unit goes to PLAY and STILL mode.
7. When the adjustment is completed, the unit goes to STOP mode.
8. When this adjustment is terminated (keep PLAY mode), the following code appear on the FLP display.

CODE	Contents
F6	Not Specified.
F7	Force to step the adjustment during adjustment mode.

3. EE Level Adjustment (AG-RT650P only)

1. Connect the oscilloscope to the Video out terminal.
2. Confirm the video level so that $1.0 \pm 0.15V$.
3. If not, adjust VR3501 to be in specification.



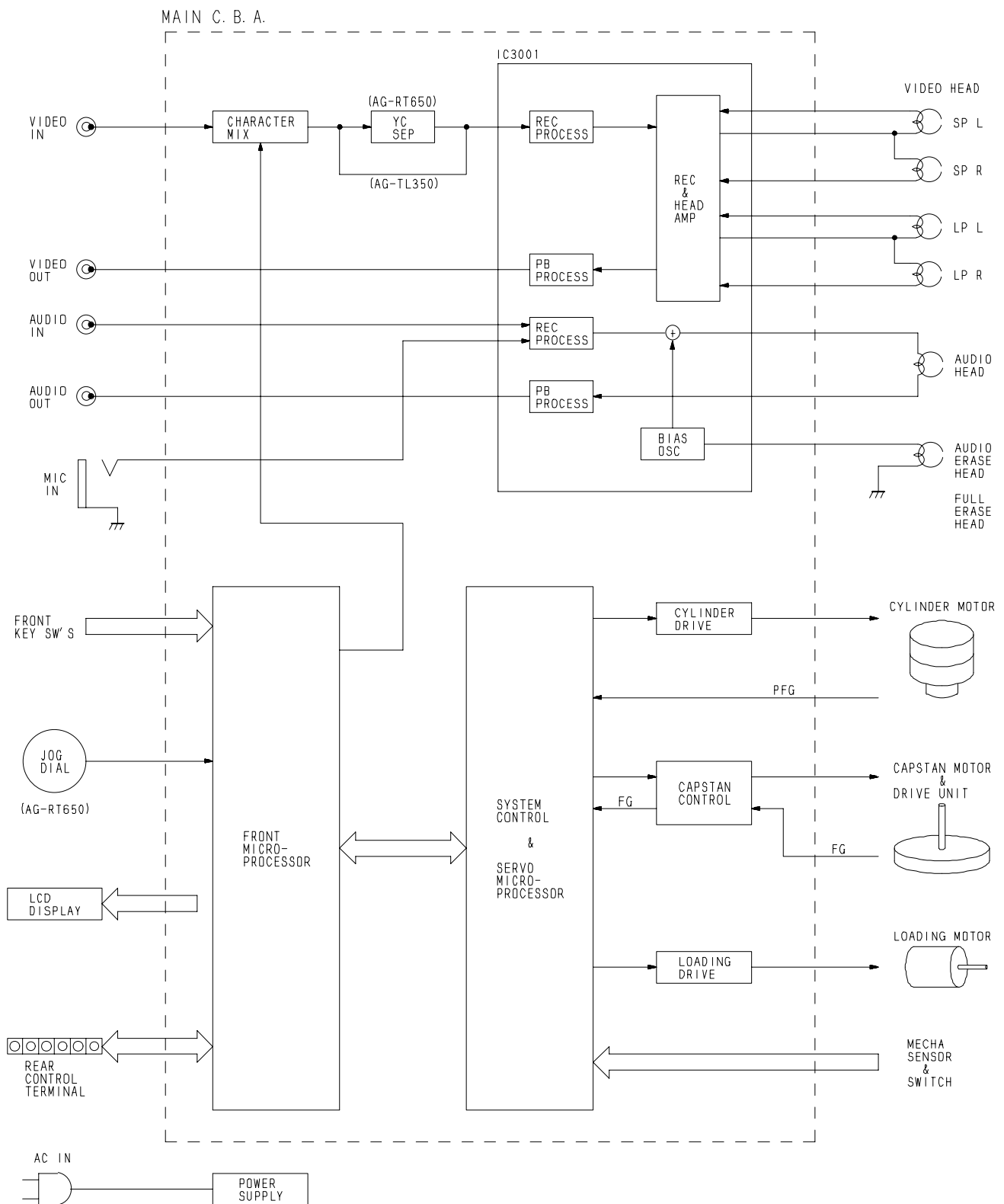
SECTION 6

BLOCK DIAGRAMS

CONTENTS

OVERALL BLOCK DIAGRAM	BLK-1
VIDEO/AUDIO BLOCK (MAIN C.B.A.) DIAGRAM.....	BLK-2
SYSTEM CONTROL/SERVO BLOCK (MAIN C.B.A.) DIAGRAM	BLK-3
FRONT BLOCK (MAIN C.B.A.) DIAGRAM.....	BLK-4

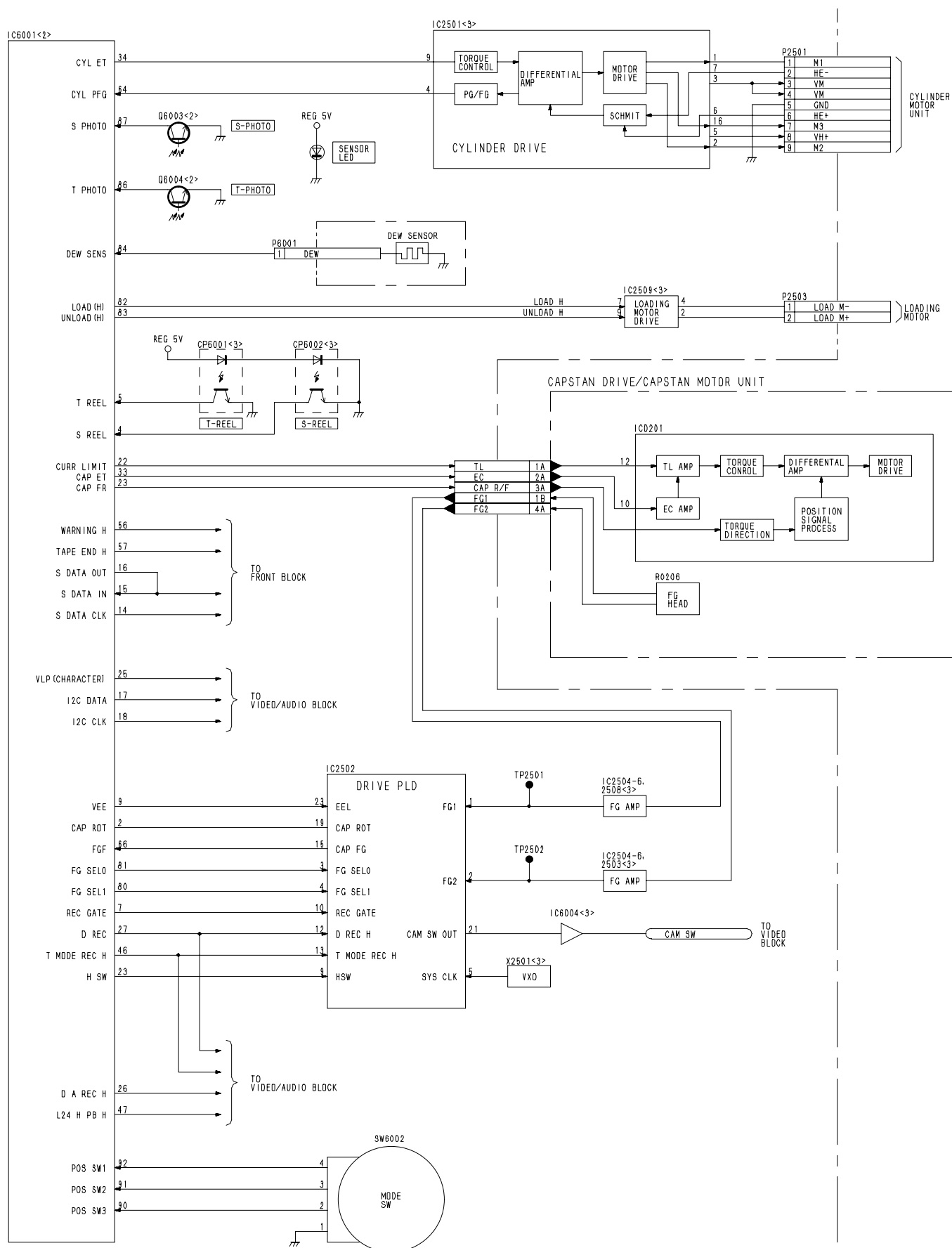
OVERALL BLOCK DIAGRAM



REAR JACK
C. B. A.

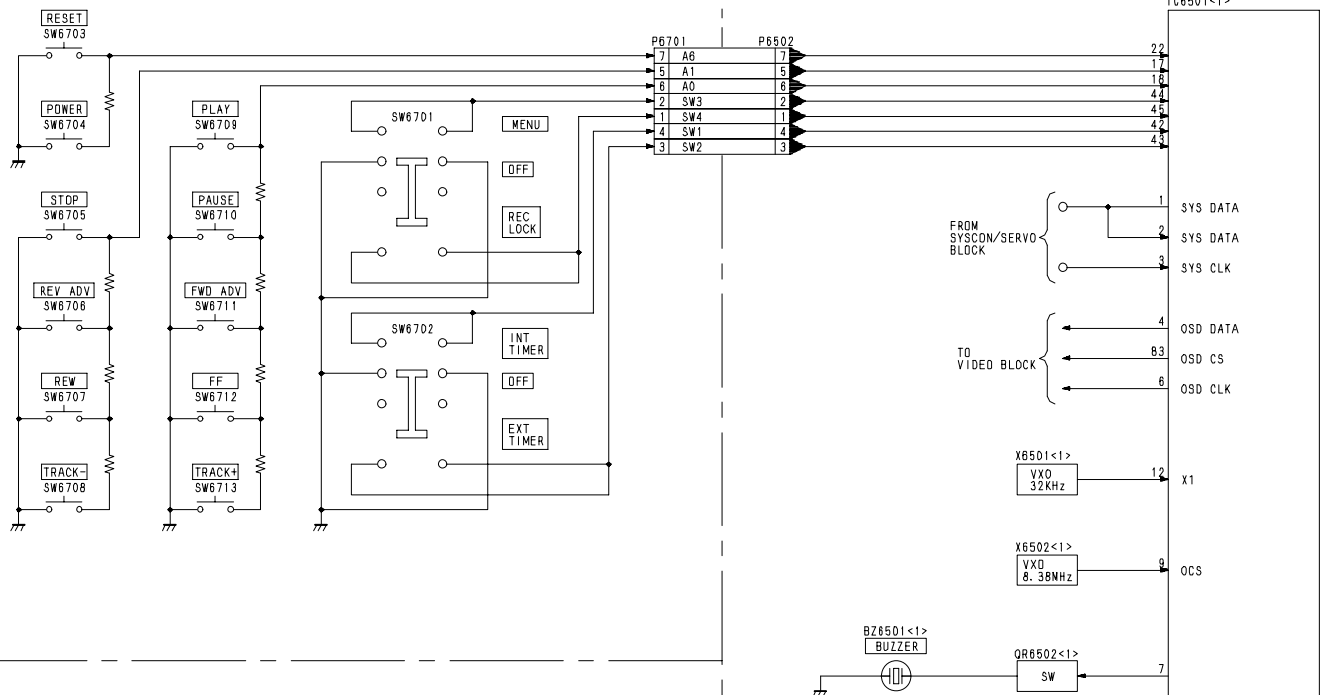


SYSTEM CONTROL/SERVO BLOCK (MAIN C.B.A.) DIAGRAM

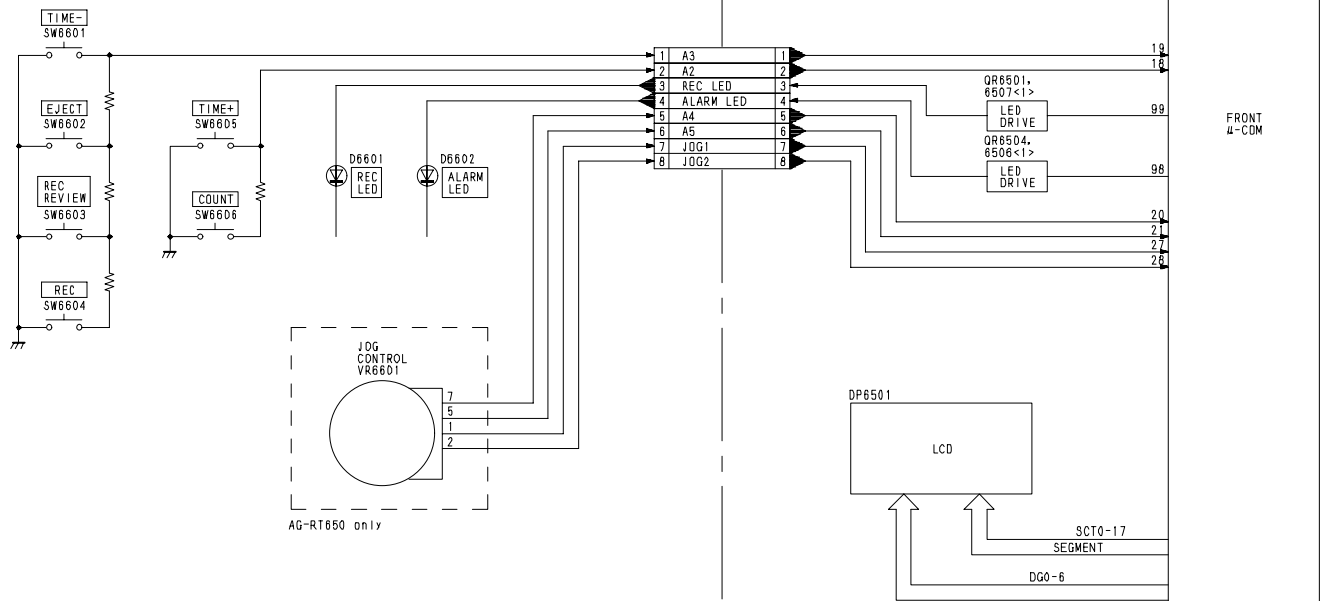


FRONT BLOCK (MAIN C.B.A.) DIAGRAM

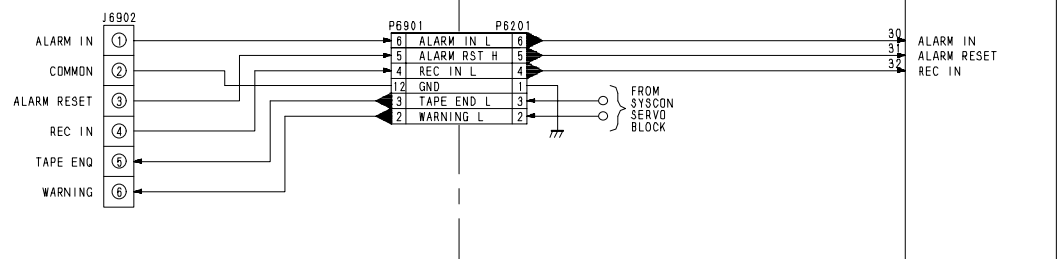
FRONT L C. B. A.



FRONT R C. B. A.

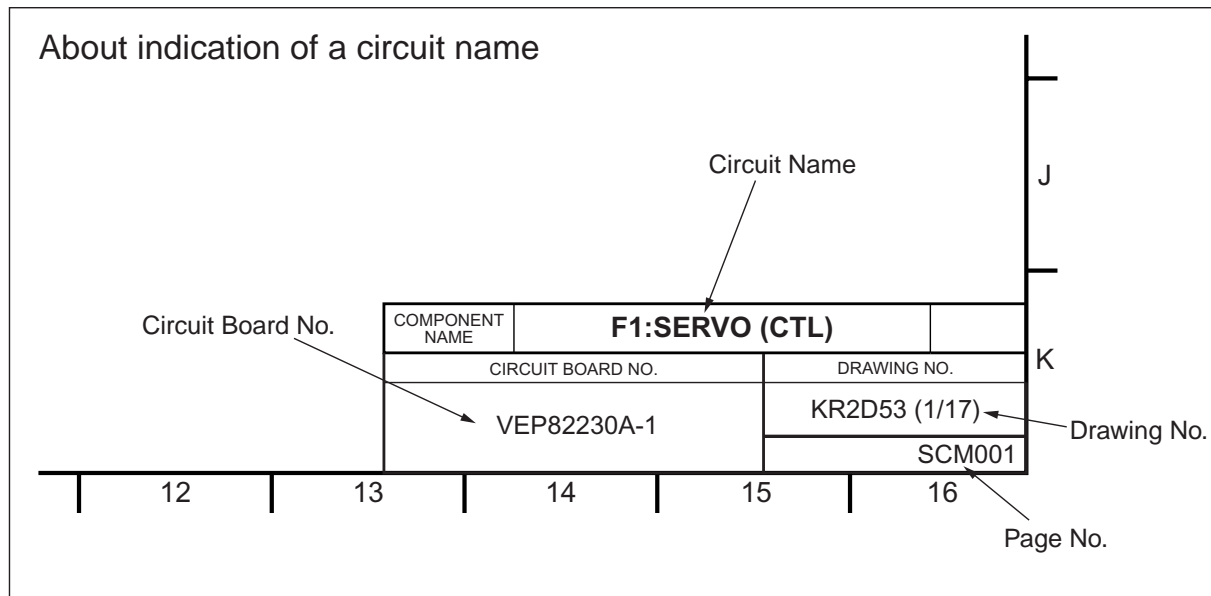


REAR JACK C. B. A.



SECTION 7

SCHEMATIC DIAGRAMS




NOTE:
BE SURE TO MAKE YOUR ORDERS OF REPLACEMENT PARTS ACCORDING TO PARTS LIST.

CAUTION

THE ☐ MARK INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

IMPORTANT SAFETY NOTICE:

COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

CONTENTS

MAIN

CONNECTOR (1/32).....	SCM1
SYS_IF (2/32).....	SCM2
L1/VIDEO_IN (3/32)	SCM3
L1/REC VPLD (4/32).....	SCM4
L1/EE1_MEMORY (5/32)	SCM5

FRONT L

FRONT_L (1/1).....	SCM6
--------------------	------

FRONT R

FRONT_R (1/1).....	SCM7
--------------------	------

REAR JACK

REAR JACK (1/1).....	SCM8
----------------------	------

MIC JACK

MIC JACK (1/1)	SCM9
----------------------	------

YC SEP

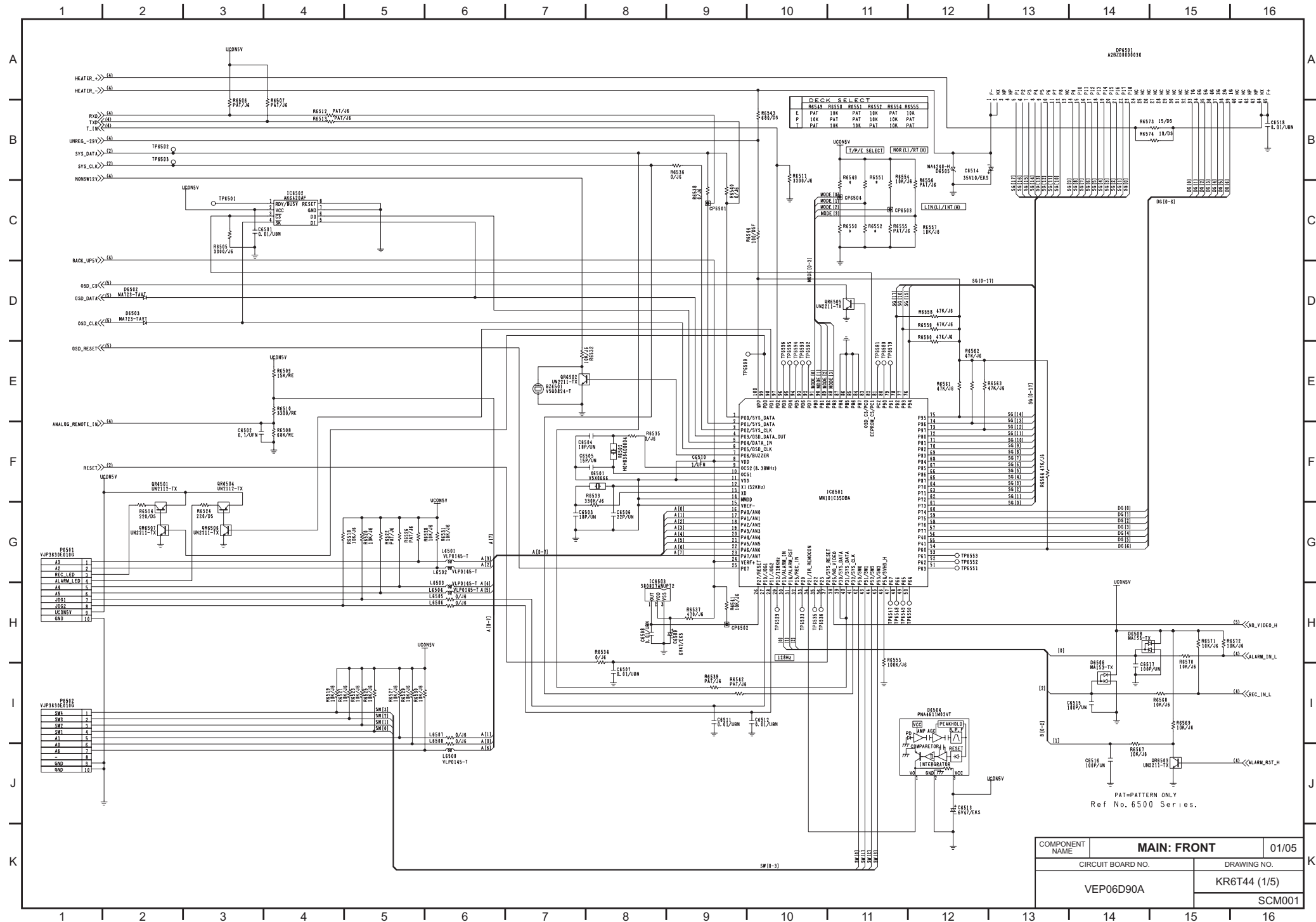
YC_SEP (1/1).....	SCM10
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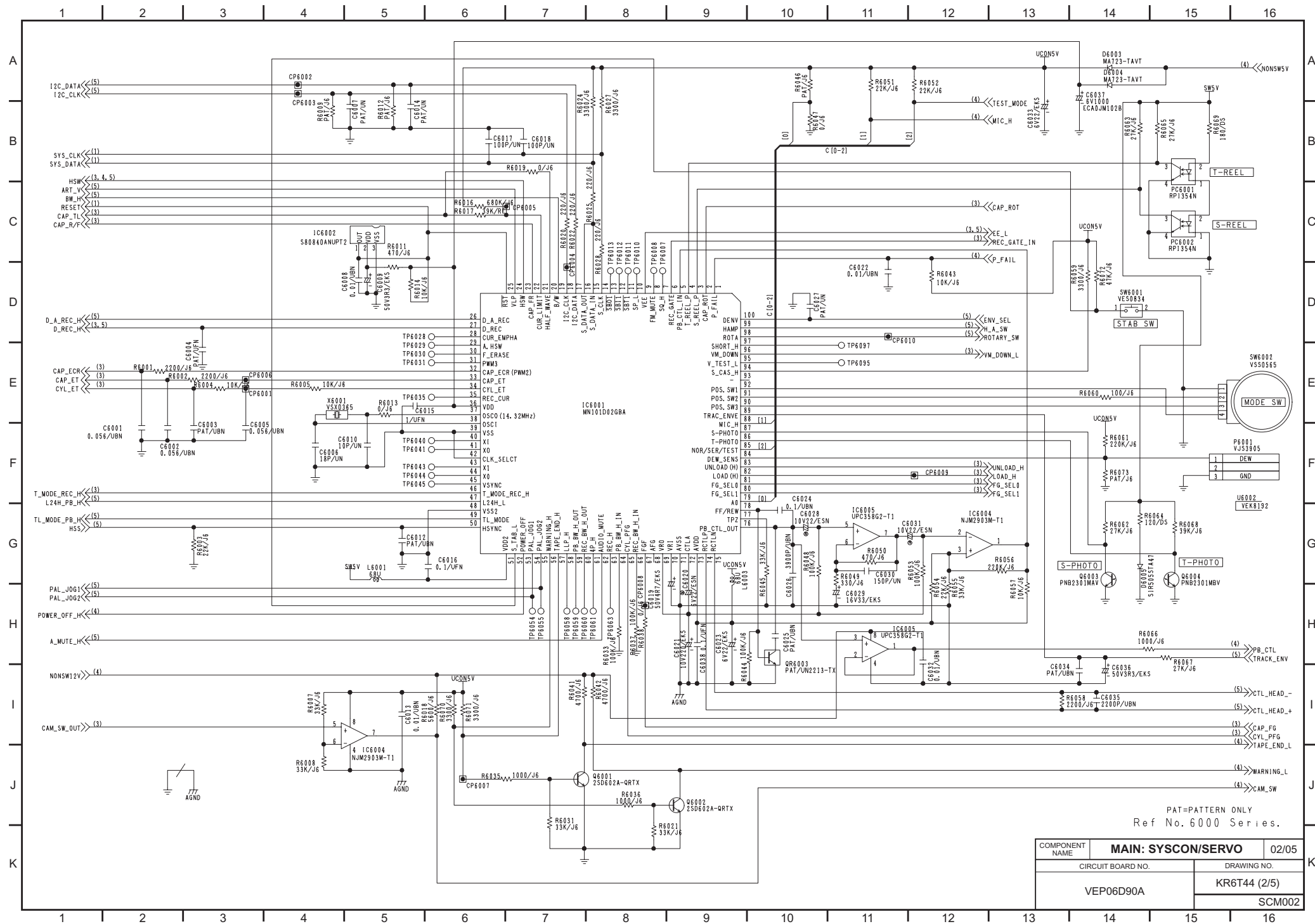
POWER SUPPLY

AG-RT650P: POWER SUPPLY (1/1).....	SCM11
AG-RT650: POWER SUPPLY (1/1)	SCM12

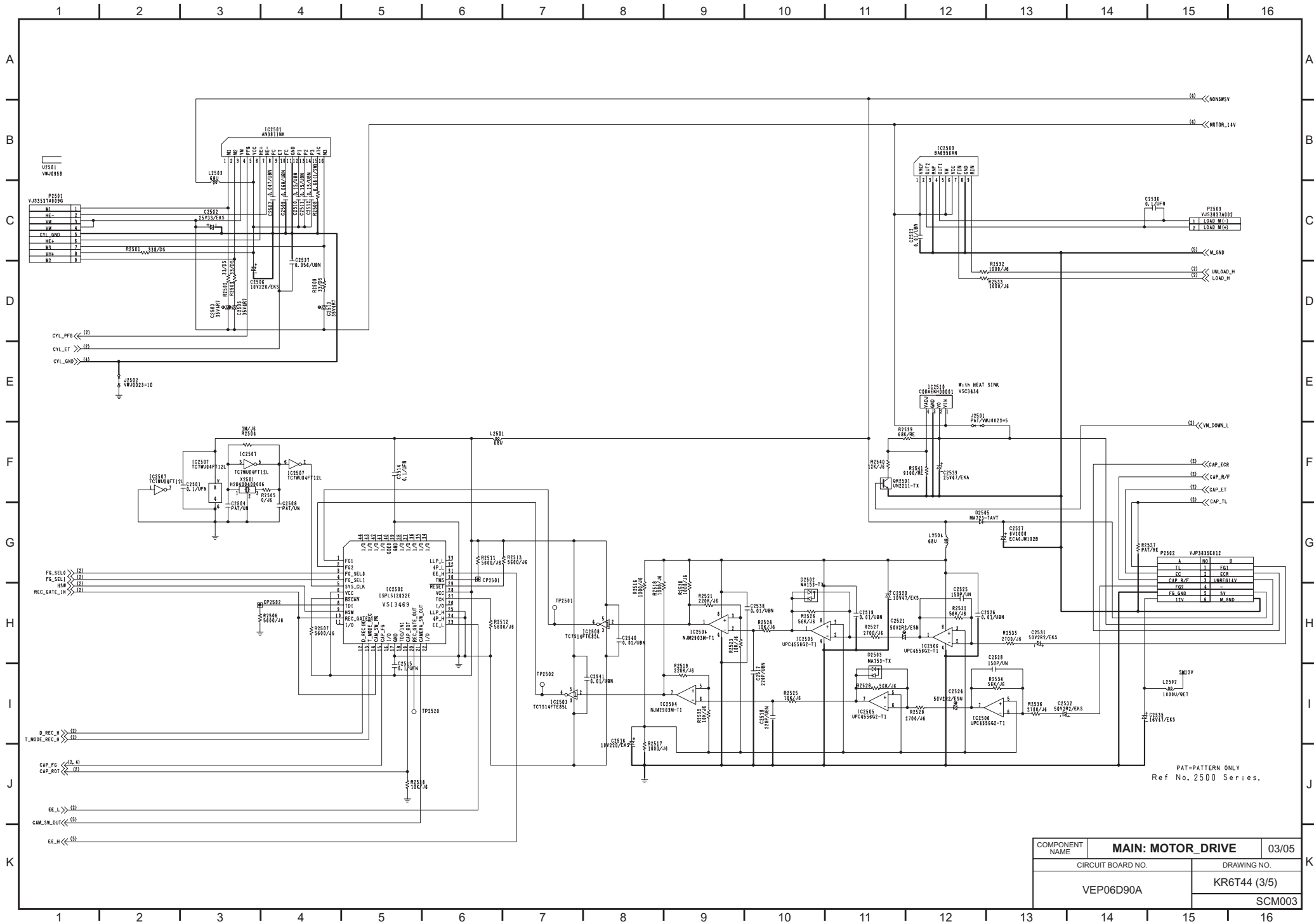
INTERCONNECTION

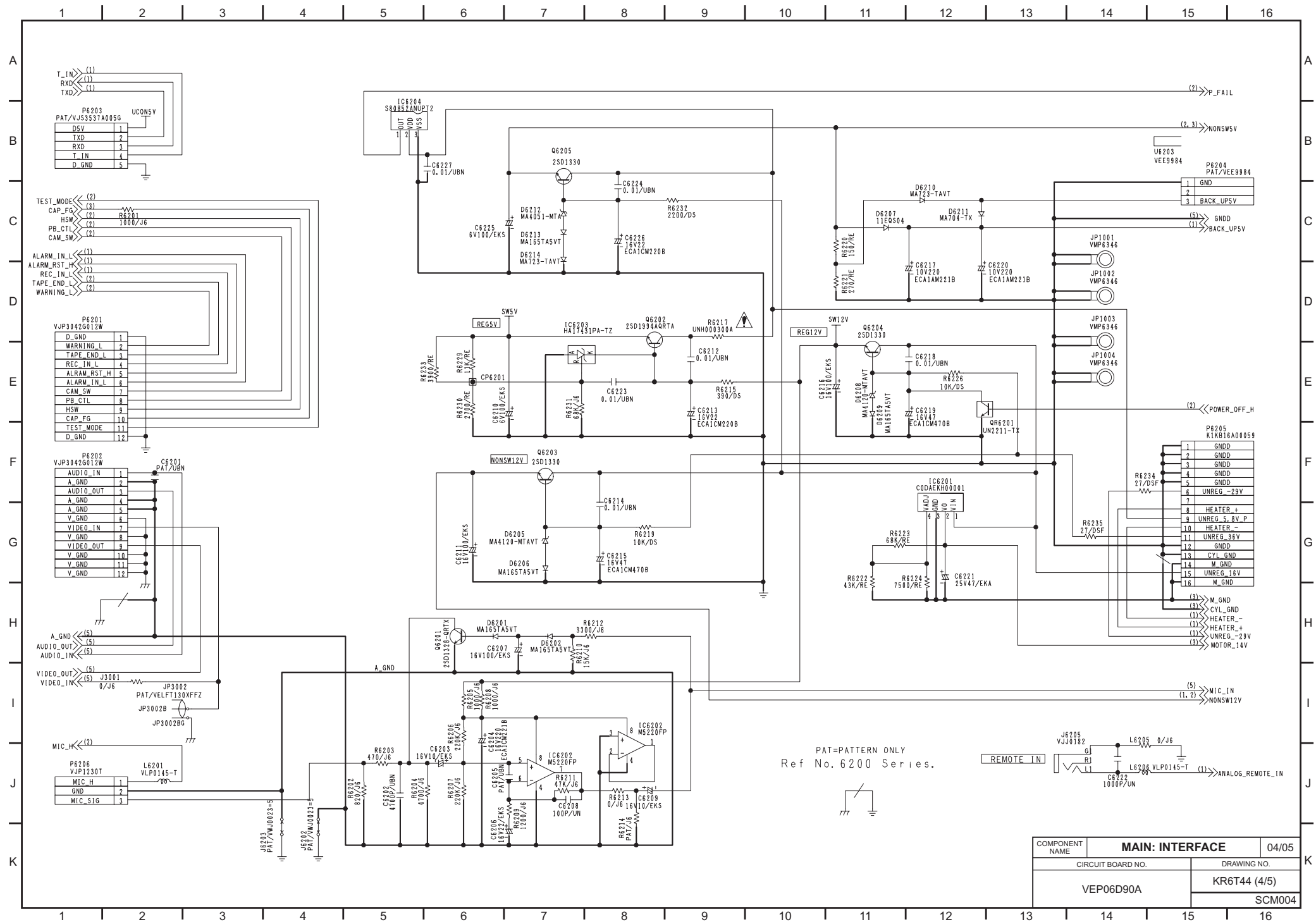
INTERCONNECTION (1/1).....	SCM13
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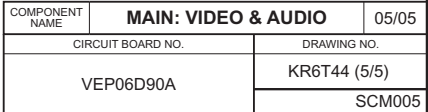


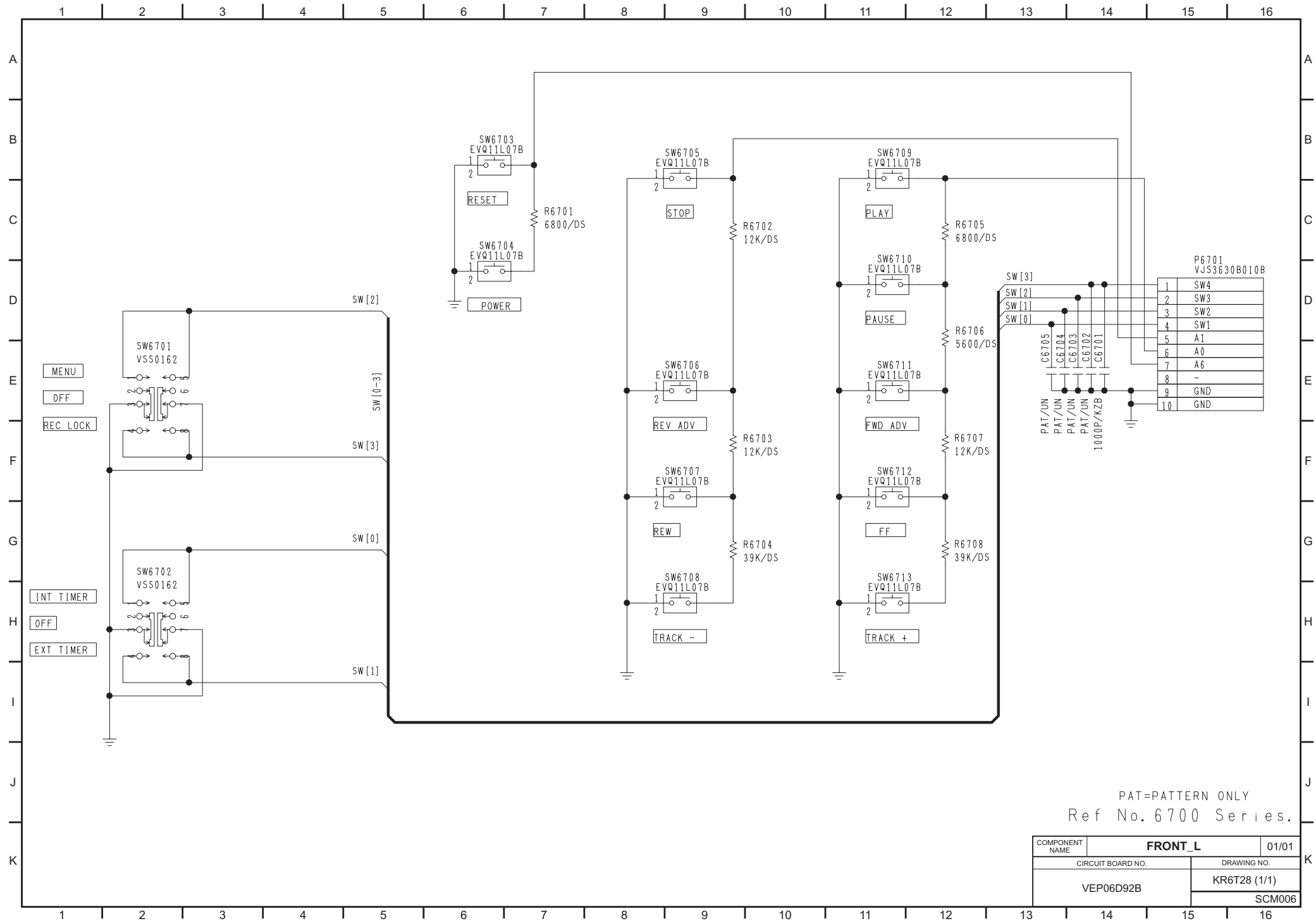


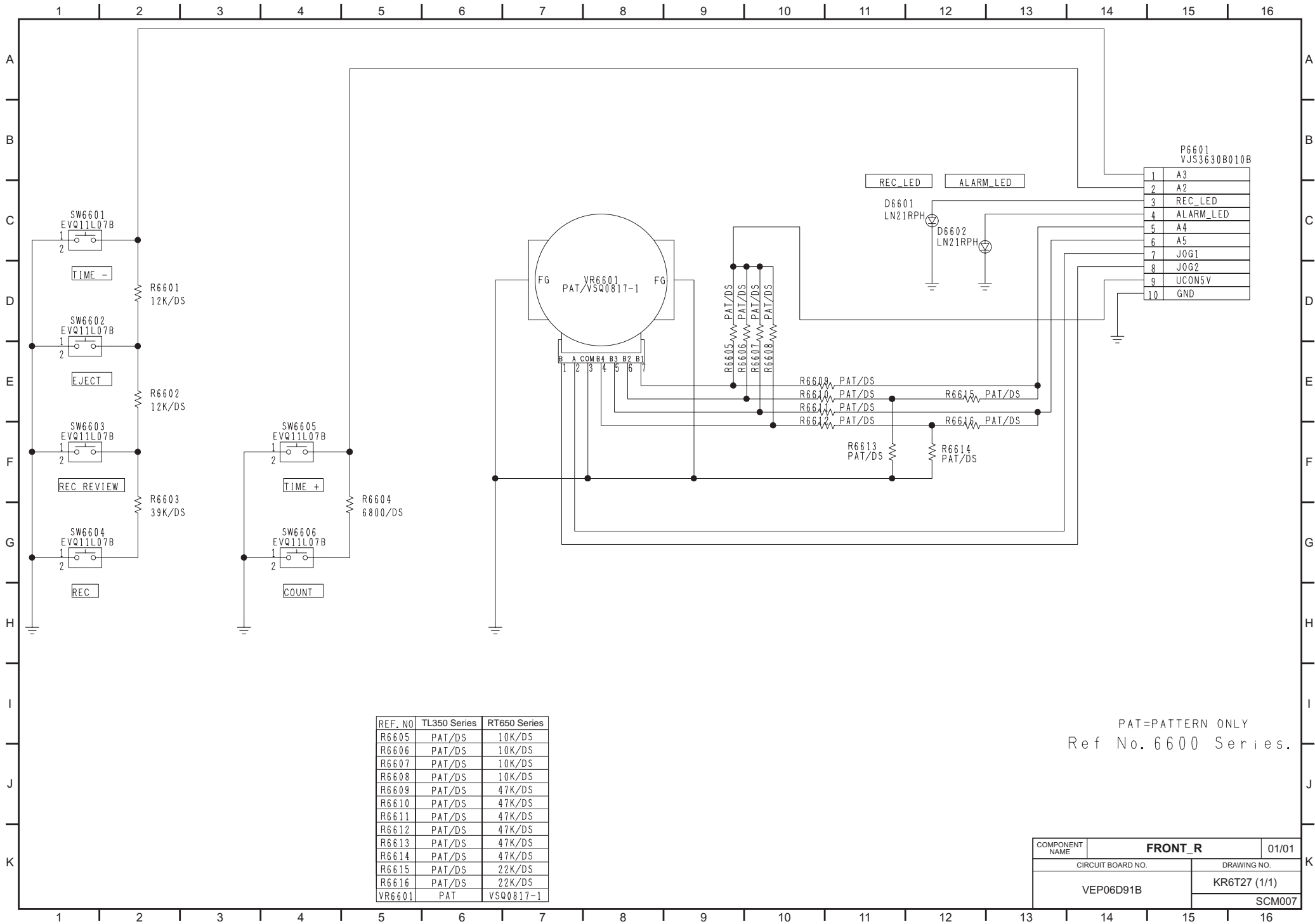
COMPONENT NAME	MAIN: SYSCON/SERVO		02/05
CIRCUIT BOARD NO.		DRAWING NO.	
VEP06D90A		KR6T44 (2/5)	
		SCM002	

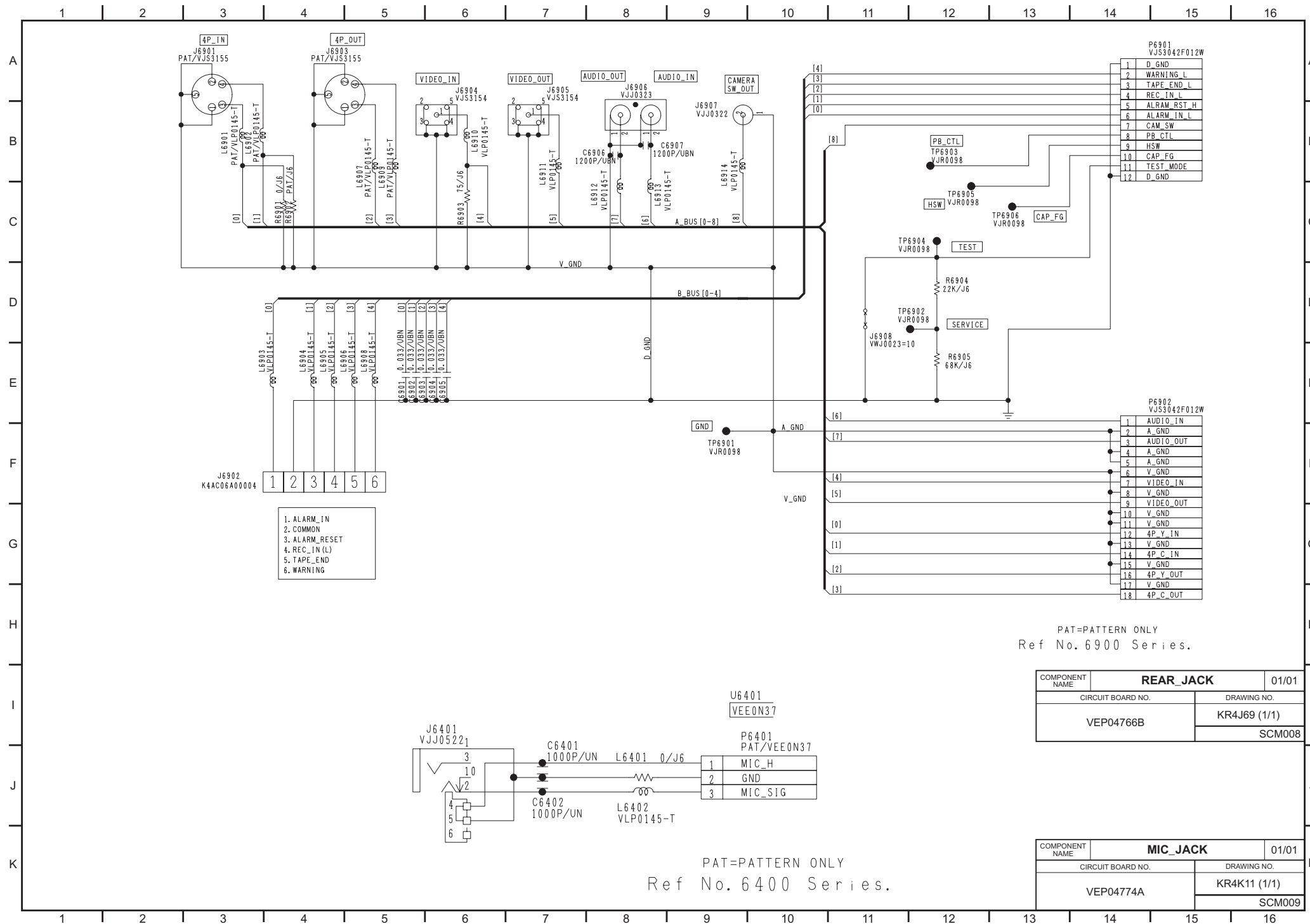


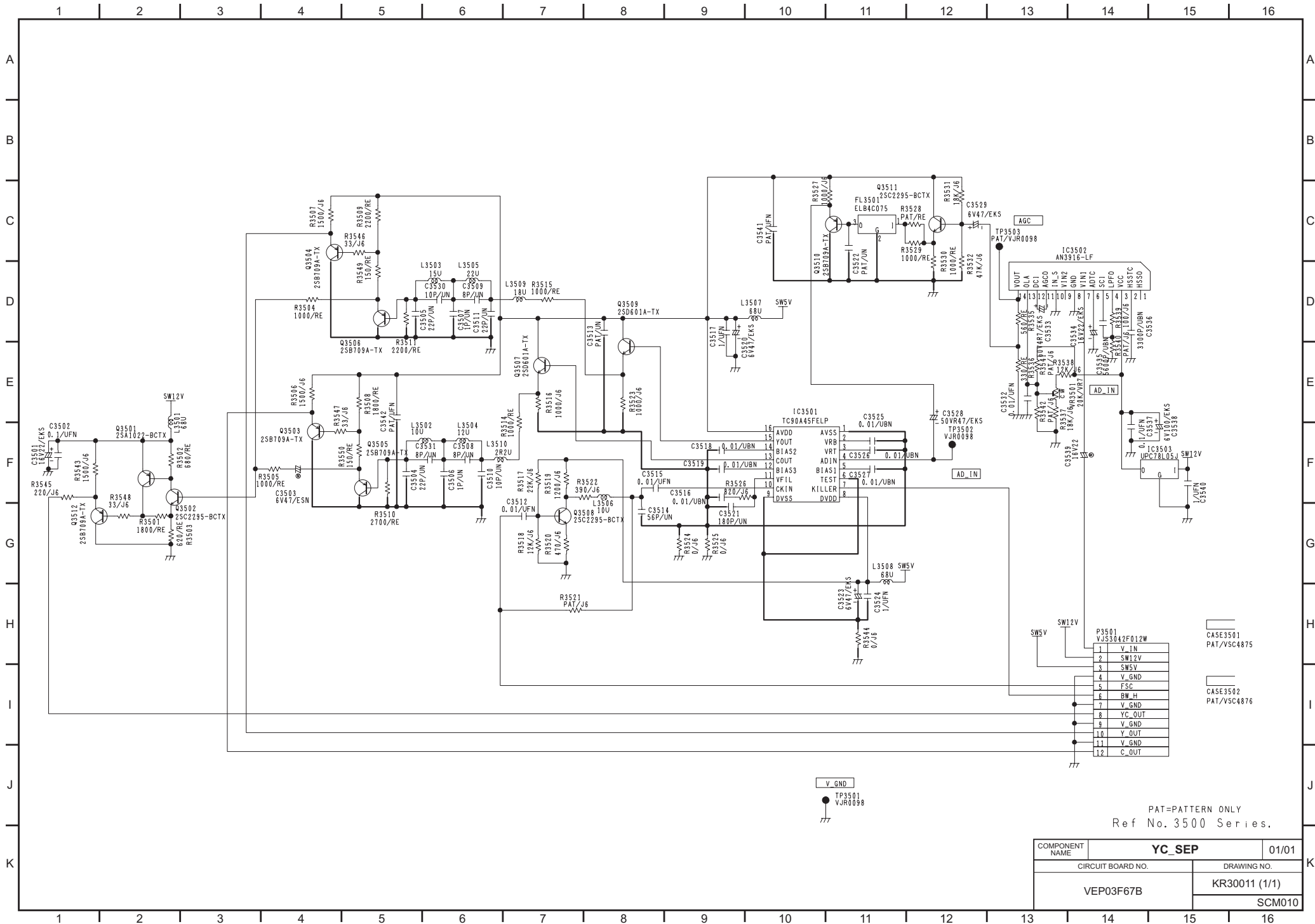


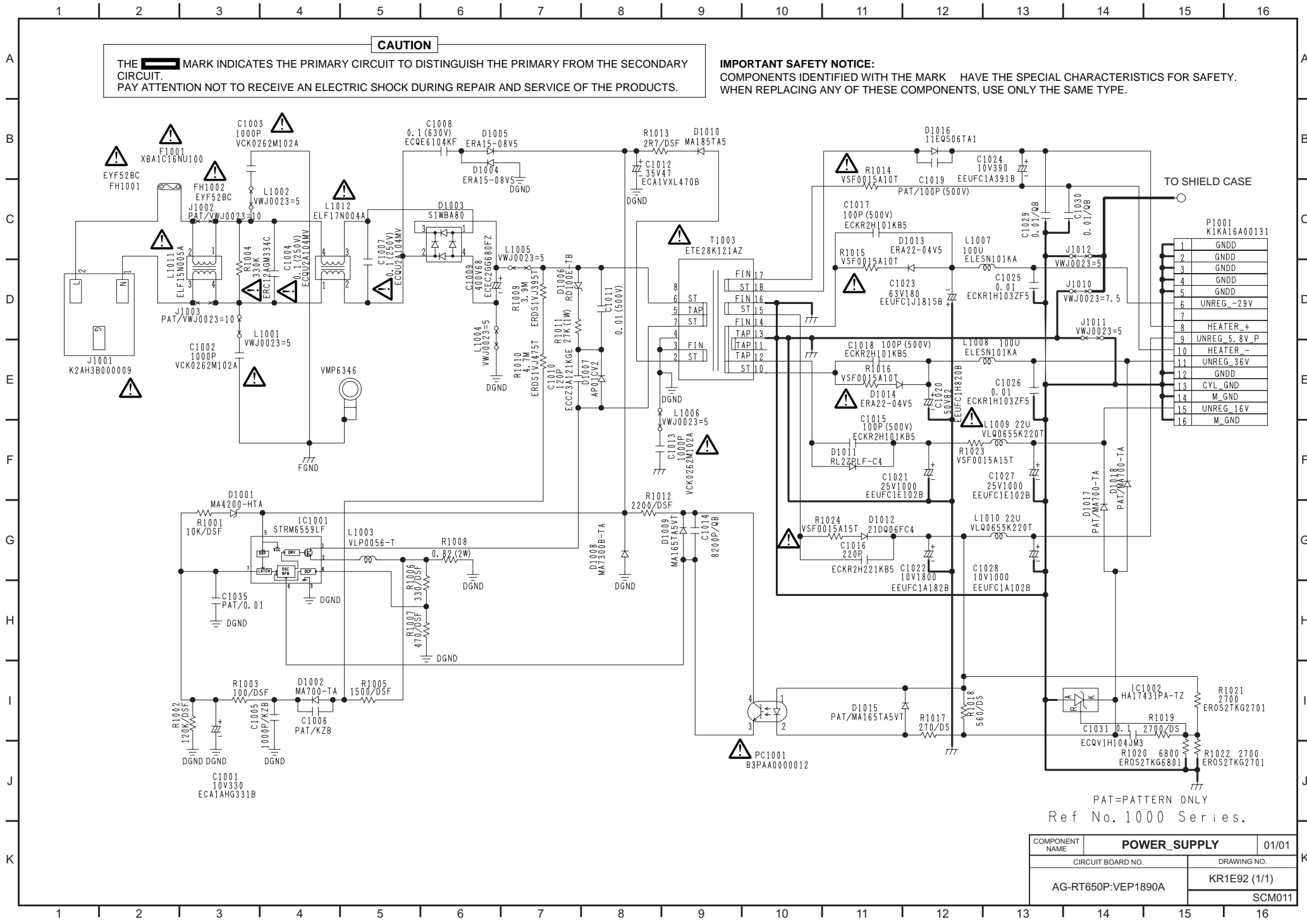


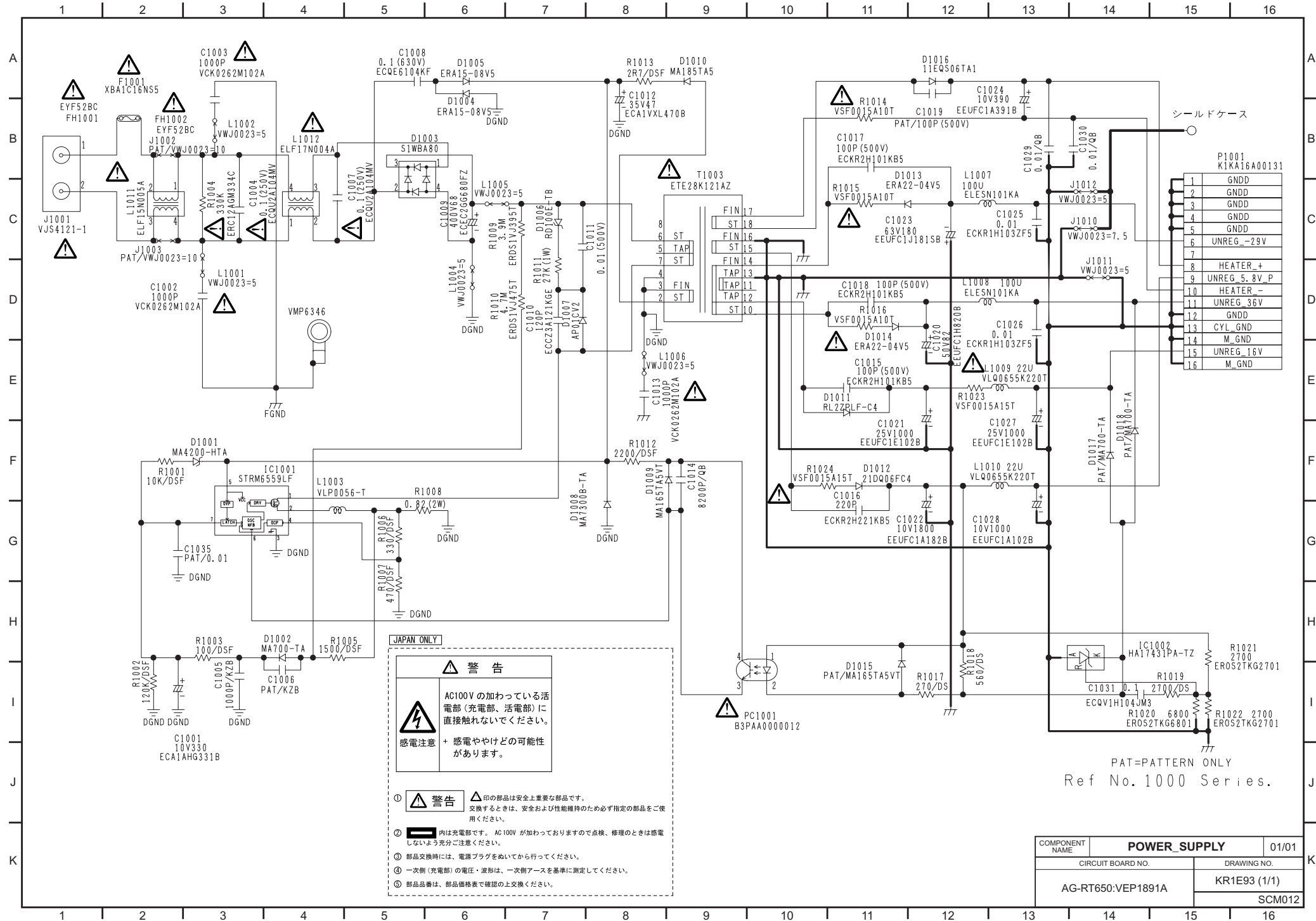


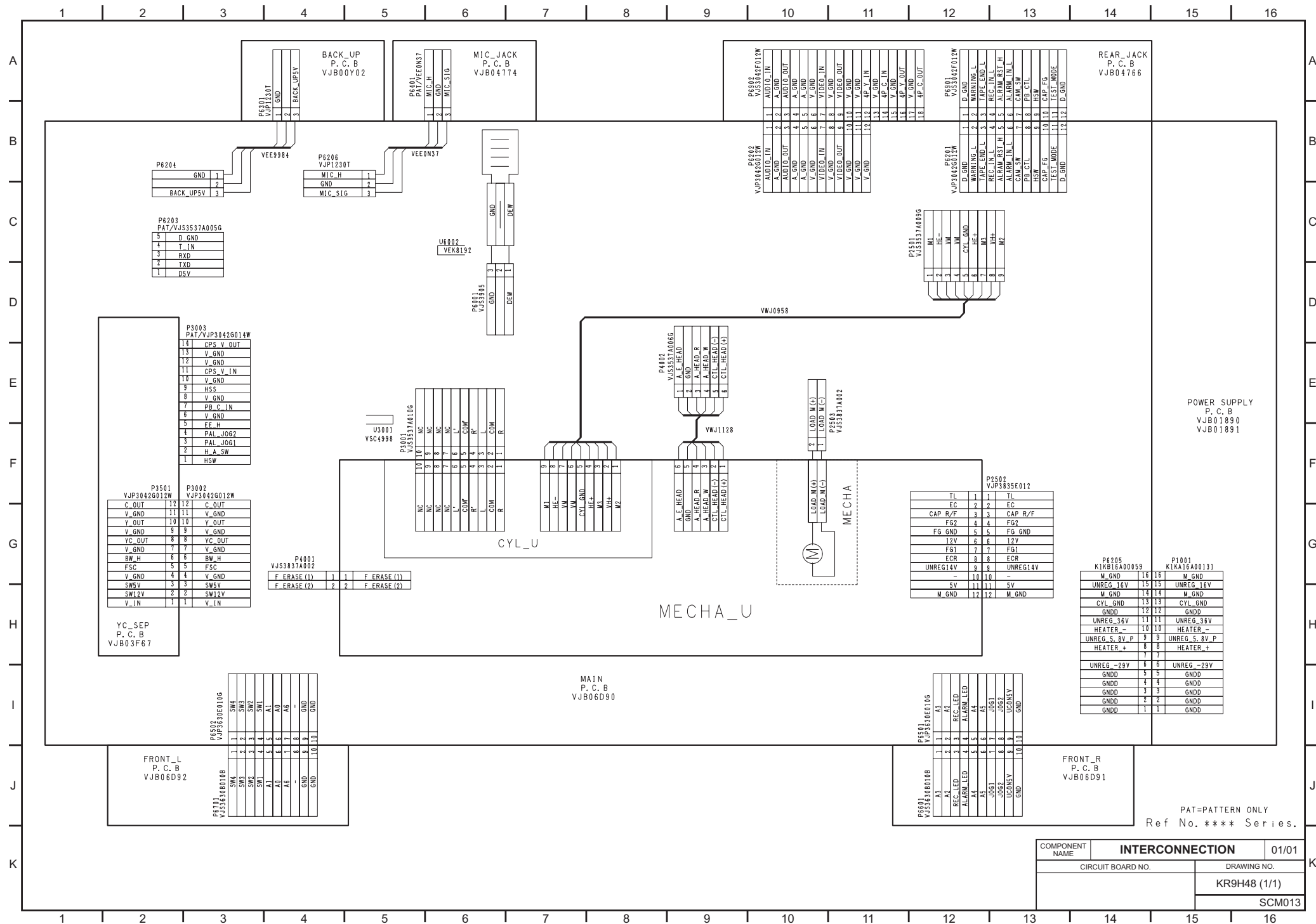












EXPLODED VIEWS & REPLACEMENT PARTS LISTS

1. *Be sure to make your orders of replacement parts according to this list.
2. Unless otherwise specified, all resistors are in OHMS, K=1,000 OHMS, all capacitors are in MICROFARADS (μF), P=μμF.
3. The P.C. Board untills marked with "■" shown below the main assembled parts.
4. The parts marked with ⓔ on the exploded view show the electric parts.
5. **IMPORTANT SAFETY NOTICE**
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.
6. The marking (RTL) indicates the retention time is limited for this item.
After the diacontinuation of this assembly in production, it will no longer be available.

Mechanical Replacement Parts List & Exploded ViewsPRT-1


Mechanical Chassis AssemblyPRT-1

Chassis Frame AssemblyPRT-3


Packing Parts Assembly.....PRT-5


Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VFK0329	POST ADJ. SCREWDRIVER	1	
	VFK0132A	BACK TENSION METER	1	
	VFK0330	FINE ADJ. SCREWDRIVER	1	
	VFK0326	HEX. WRENCH SET	1	
	VFK0948A	CHECK LIGHT	1	
	MOR265	MOLY TONE GREASE	1	
	VFK27	HEAD CLEANING STICK	1	
	VFJ8125H3F	ALIGNMENT TAPE (PAL)	1	
	VFM8080HQFP	ALIGNMENT TAPE (NTSC)	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VFK0335	RETAINING RING REMOVER	1	
	VFK0680	S.C.R. GREASE	1	
	VFK1298	FLOIL GREASE	1	
	VFK1301	SILICONE GREASE	1	
	VFK2744	16PIN EXTENSION CABLE	1	
	VFK0131	HIGH QUALITY SPINDLE OIL	1	

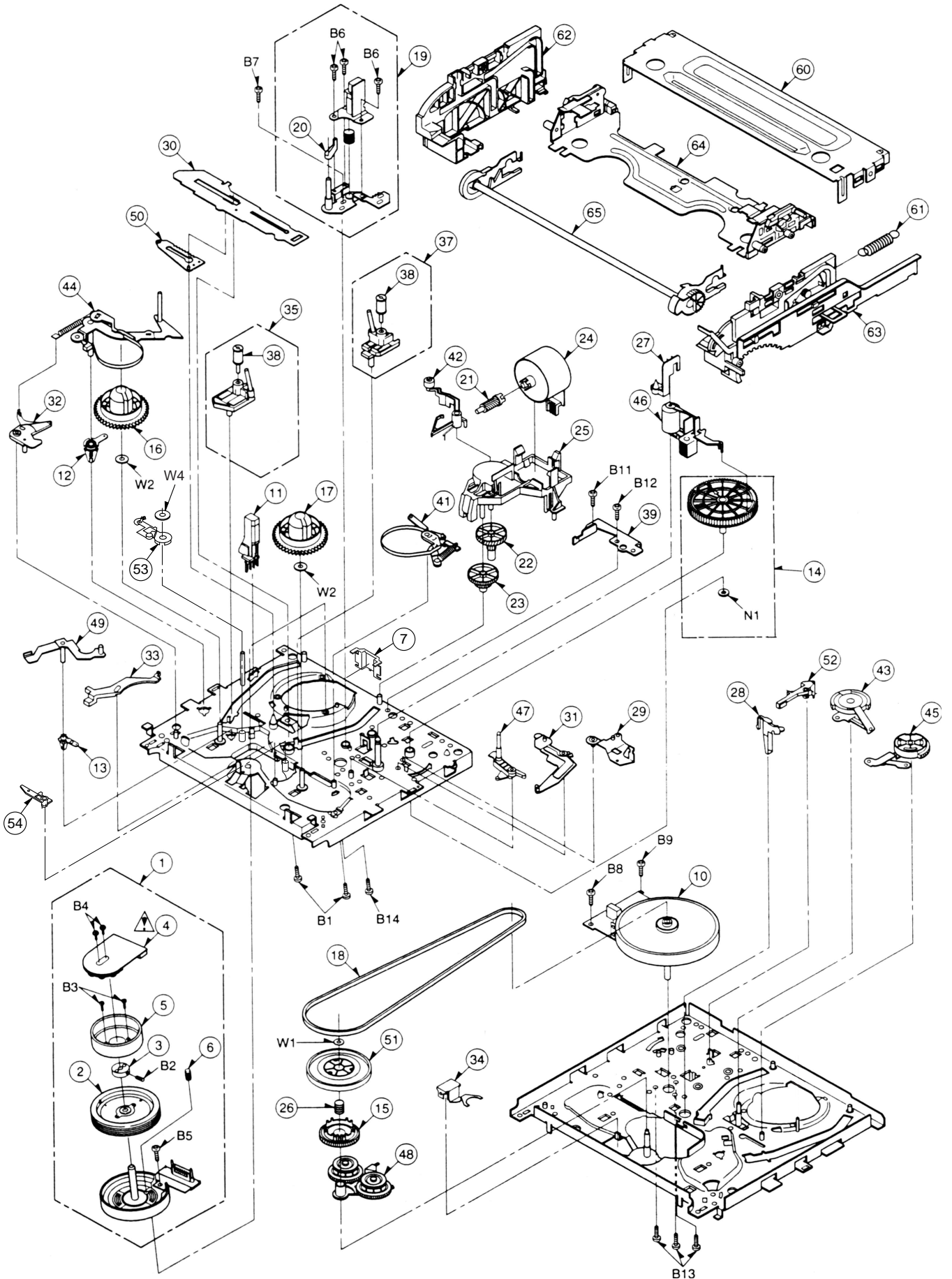
Components identified with the mark  have the special characteristics for safety.
When replacing any of these components, use only the same type.

MECHANICAL CHASSIS ASSEMBLY


Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1 (1)	VEG1541	CYLINDER UNIT	1		W2 (1)	VMX2650	WASHER	2	
2 (1)	VXP2038	UPPER CYLINDER UNIT	1		W4 (1)	VMX2699	WASHER	1	
3 (1)	VDB1256	CYLINDER RETAINER	1						
 4 (1)	VEK8840	STATOR ASS'Y	1						
5 (1)	VXP1956	ROTOR ASS'Y	1						
6 (1)	VXS0135	EARTH BRUSH ASS'Y	1						
10 (1)	VEK9203	CAPSTAN ASS'Y	1						
11 (1)	VBS0155	FE HEAD	1						
12 (1)	VDB1431	TENSION ARM BOSS	1						
13 (1)	VDB1460	SUPPLY BRAKE ARM BOSS	1						
14 (1)	VDG1220KIT	MAIN CAM GEAR	1						
15 (1)	VDG1221	CONVERSION GEAR	1						
16, 17 (1)	VDR0350	TAKE UP REEL TABLE	2						
18 (1)	VDV0382	CAPSTAN BELT	1						
19 (1)	VED0412	A/C HEAD ASS'Y	1						
20 (1)	VMX2656	P4 CAP	1						
21 (1)	VDG1217	WORM GEAR	1						
22 (1)	VDG1218	WORM WHEEL GEAR	1						
23 (1)	VDG1219	CENTER GEAR	1						
24 (1)	VEM0604	LOADING MOTOR ASS'Y	1						
25 (1)	VMD2619	MOTOR BRACKET	1						
26 (1)	VMB3045	CONVERSION GEAR SPRING	1						
27 (1)	VMD2620	OPENER PIECE	1						
28 (1)	VMD2738	LED PRISM	1						
29 (1)	VML3165	DRIVE RACK ARM	1						
30 (1)	VML3166	MAIN LEVER	1						
31 (1)	VML3167	DRIVE MAIN LEVER ARM	1						
32 (1)	VML3172	SUPPLY SPRING ARM	1						
33 (1)	VML3176	CONVERSION LEVER A	1						
34 (1)	VML3177	CONVERSION LEVER B	1						
35 (1)	VXA6040	INCLINED BASE (S) ASS'Y	1						
37 (1)	VXA5854	INCLINED BASE (T) ASS'Y	1						
38 (1)	VXP1840	ROLLER POST	2						
39 (1)	VMA9672	SUPPORT ANGLE	1						
41 (1)	VXL2667	TAKE UP BRAKE ARM ASS'Y	1						
42 (1)	VXL2669	CLEANER ARM ASS'Y	1						
43 (1)	VXL2670	TAKE UP LOADING ARM ASS'Y	1						
44 (1)	VXL2793	TENSION ARM ASS'Y	1						
45 (1)	VXL2672	SUPPLY LOADING ARM ASS'Y	1						
46 (1)	VXL3037	PINCH ARM ASS'Y	1						
47 (1)	VXL2677	P5 ARM ASS'Y	1						
48 (1)	VXL2792	IDLER ARM ASS'Y	1						
49 (1)	VXL2737	CLAW LOWER ARM ASS'Y	1						
50 (1)	VXL2747	LOADING RACK ASS'Y	1						
51 (1)	VXP2035	CENTER CLUTCH ASS'Y	1						
52 (1)	VXZ0430	SS BRAKE ARM ASS'Y	1						
53 (1)	VXL2783	REV ARM ASS'Y	1						
54 (1)	VML3276	IDLER POSITIONING ARM	1						
60 (1)	VMA9516	TOP PLATE	1						
61 (1)	VMB3047	CONNECTION SPRING	1						
62 (1)	VMD3379	SIDE PLATE (L)	1						
63 (1)	VXA6607	SIDE PLATE (R) ASS'Y	1						
64 (1)	VXA5746	CASSETTE HOLDER ASS'Y	1						
65 (1)	VXP1730	MAIN SHAFT ASS'Y	1						
B1 (1)	VHD1117	SCREW	2						
B2 (1)	VHD0842	SCREW	1						
B3 (1)	VHD0843	SCREW	2						
B4 (1)	VHD0844	SCREW	2						
B5 (1)	XYN26+C5	SCREW	1						
B6 (1)	VHD1066	SCREW	3						
B7 (1)	VHD1044	SCREW	1						
B8 (1)	VHD1060	SCREW	1						
B9 (1)	VHD1071	SCREW	1						
B11 (1)	XTS26+6F	SCREW	1						
B12 (1)	XTN26+6F	SCREW	1						
B13 (1)	XTN26+7J	SCREW	3						
B14 (1)	VHD1095	SCREW	1						
N1 (1)	VHN0311	PUSH NUT	1						
W1 (1)	VMX2208	CUT WASHER	1						

Components identified with the mark  have the special characteristics for safety.
When replacing any of these components, use only the same type.

MECHANICAL CHASSIS ASSEMBLY



CHASSIS FRAME ASSEMBLY

Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.

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CHASSIS FRAME ASSEMBLY

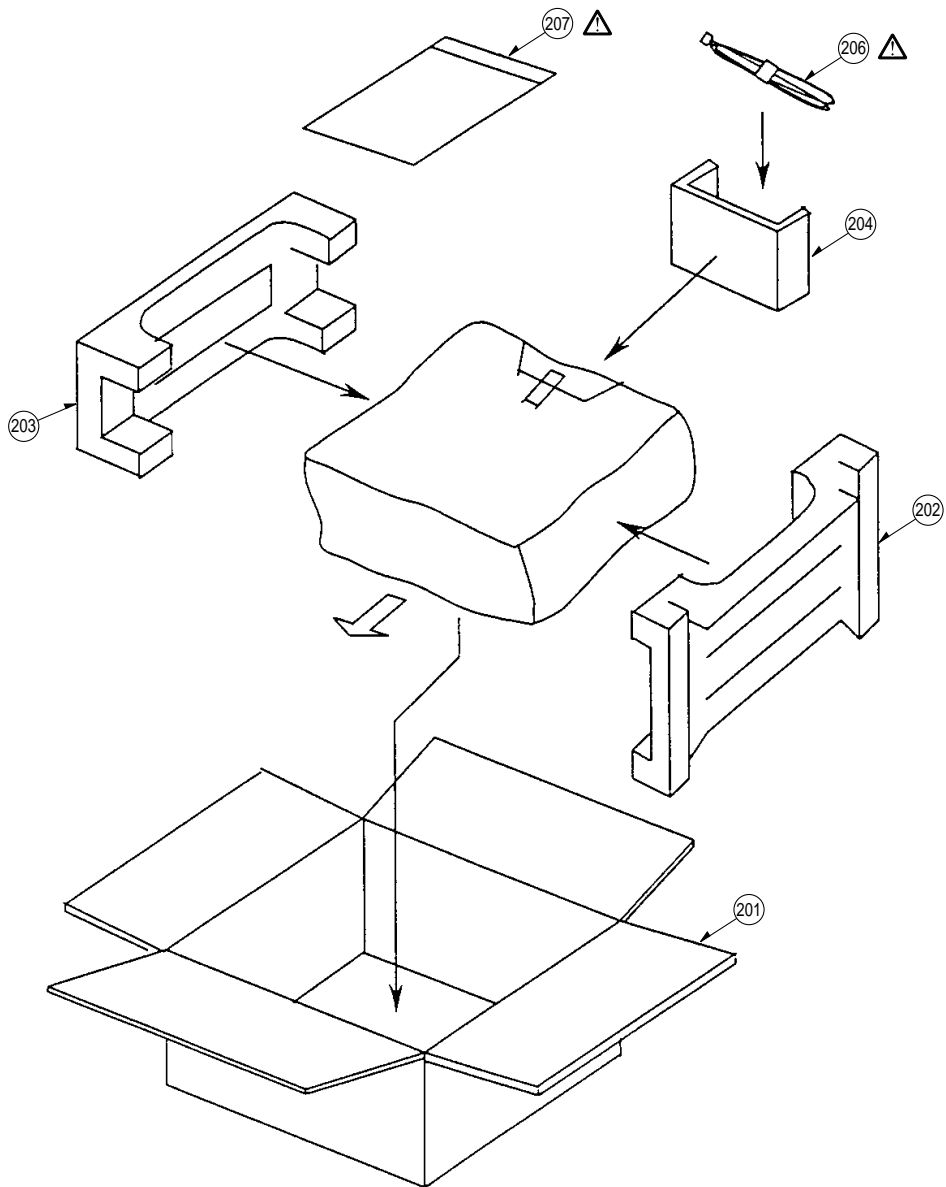
Components identified with the mark have the special characteristics for safety. When replacing any of these components, use only the same type.




PRT-4

PACKING PARTS ASSEMBLY Components identified with the mark have the special characteristics for safety. When replacing any of these components, use only the same type.

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PACKING PARTS ASSEMBLY Components identified with the mark have the special characteristics for safety. When replacing any of these components, use only the same type.

Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.

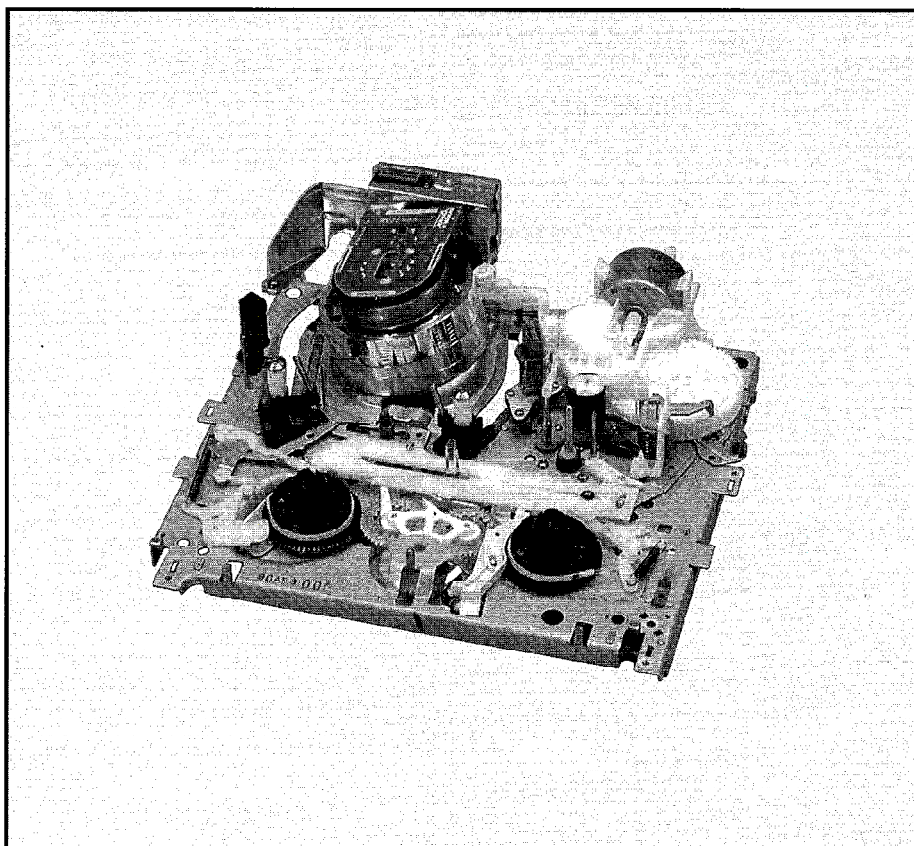
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Service Manual

Video Cassette Recorder

Panasonic **VHS**

Z-MECHANISM CHASSIS



INTRODUCTION

The Z-Mechanism chassis are built in several Panasonic VHS Video Cassette Recorders from NV-SD series in 1996.

WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.

Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

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1. OUTLINE OF Z MECHANISM

1-1. The tape transport path

(1) Mechanism Chassis

Aluminium Chassis has been changed to sheet metal (Thickness: 1.2 mm).

(2) Capstan position (Cassette-in method/Capstan-in method)

The Tape does not touch the Cassette tape so that the rationalization has been promoted such as Reel gear pinch up/down mechanism has been deleted.

(3) Deletion of P1 post

FE Head has been installed Limiter so that P1 post has been deleted.

(4) A/C Head base combined with P4 post

A/C Head has been combined with P4 post on the same base.

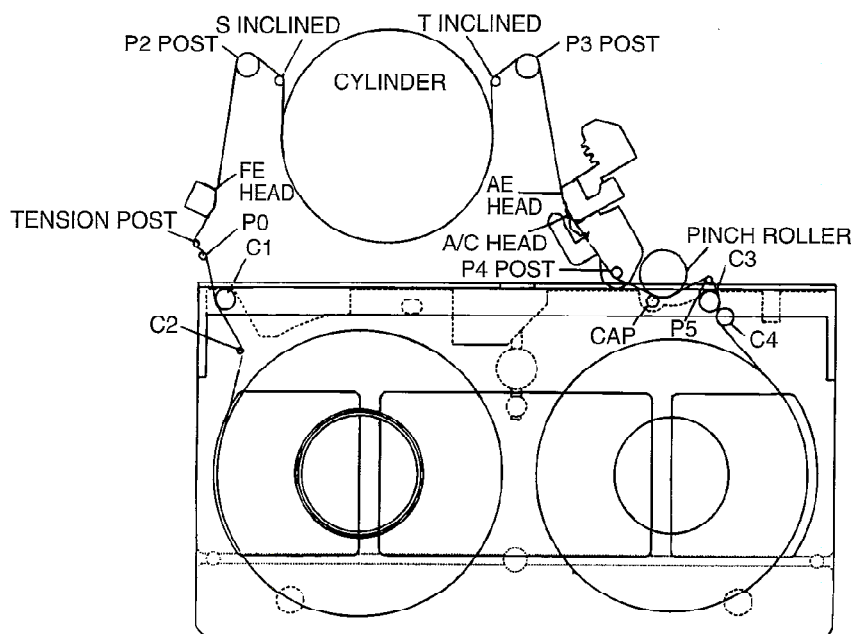
(5) Change of A/C head base type

The change of the angle winding the tape on A/C head has been reduced by the construction of A/C head base has been changed from the revolution type to slide base type.

(6) Improvement of P5 post

P5 post operation has been changed by non-adjustable of the Height and the Tilt adjustment so that the specification has been improved.

Z Mechanism tape transport path in REV mode



1-2. Cassette holder unit

(1) Cassette-in operation

The Rack drive arm drives Main Cam gear by inserting the cassette tape. Consequently, Position switch detects the cassette-in mode so that Loading motor drives. The mode goes to the Stop mode from the Cassette-in through the Loading mode.

① The parts quantity reduction of Cassette holder unit.

(Z Mechanism: 21 pieces, K Mechanism: 36 pieces)

- a. Release lever has been installed in Right Side Plate.
- b. Cassette guide has been installed in Front Panel unit.
- c. Safety lever spring is made by the resin.
- d. Opener lever has been changed into the single opener type.
- e. One side of Side Plate unit is hung on Chassis in order to fix it.

② Improvement of the cassette insertion

(The force of the cassette insertion Z Mechanism: Approximately 400gm.,
K Mechanism: Approximately 600gm.)

The tooth pitch of Worm gear which has been extended against the previous model, is located on the Motor so that Worm gear can be reversed. Consequently, the Motor rotates before the insertion spring (the combined spring) is working when the cassette tape is inserted, so that the repelled force of the insertion spring has been reduced as differing from the present model.

③ Small-sized Cassette holder unit (Thinned unit)

- a. The Wiper arm method which has been adopted, assigned Wiper arm between Cassette Holder Plate and Side Plate so that the small-sized of the width has been realized.
- b. To prevent the increment of parts quantity such as Safety lever is used for Pre-open mechanism shown in the present model, and the small-sized unit has been realized by inclining one portion of the L groove in Side Plate.
- c. The part of driving change-over is located in the nearest to the center of Reel so that the depth size is compacter.

1-3. Reel brake

(1) Supply Reel Brake is used for Tension Regulator which is composed of the conventional Main brake and the soft brake function.

(2) Take-up Reel Brake is used as Band Brake unit in order to correspond with Supply Reel Brake.

※ Tension Regulator performance:

This is composed of Tension regulator and brake. The tape always is given the tension against the advance direction by Tension band.

(3) Construction of Supply reel tension regulator

Comparison of the construction with the conventional model

	Z Mechanism	K Mechanism
Tension Arm Shaft Bearing construction	Resin	Tension arm
Tension Band	Felt less Lumiller	Felt Lumiller
Braking method	Tension regulator	Main & soft brake

Operating mode and necessary function

Mechanism mode	Necessary function	Operation
Cassette down	Prevention of the tape slag (Soft brake)	Soft brake
Completion of Loading	Prevention of the tape slag (Soft brake)	Tension regulator
REV	Prevention of in Play mode to REV mode (Soft brake)	Tension regulator
PLAY, FF	Back tension adjustment	Same as the conventional
STOP	Main brake function	Tension regulator

(4) Construction of Take-up brake

Take-up brake is used Band brake as well as Supply brake depend on corresponding with Band brake is adopted at the Supply Side.

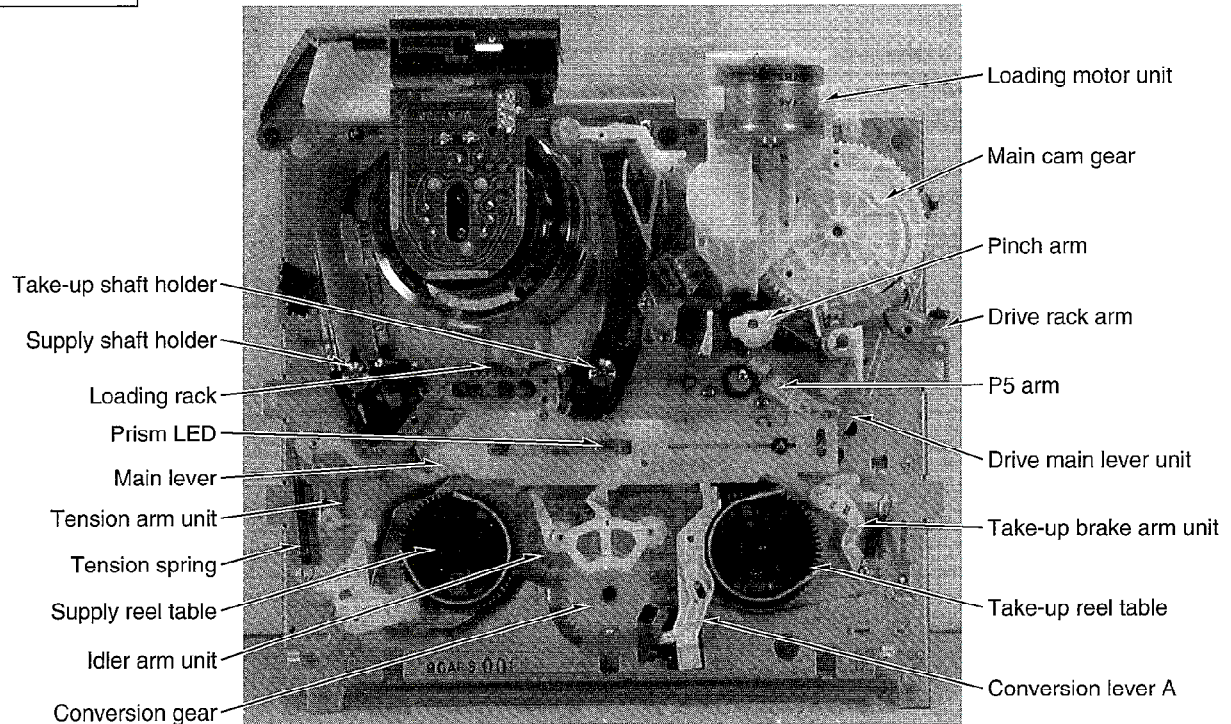
Mechanism mode	Function	Band
EJECT-MID	Soft brake	On
REV	Soft brake	On
PLAY	Release of brake	Off
STOP	Brake	On
FF/REW	Release of brake	Off

1-4. Number of Gear Phase Alignment Point and Replacement Parts

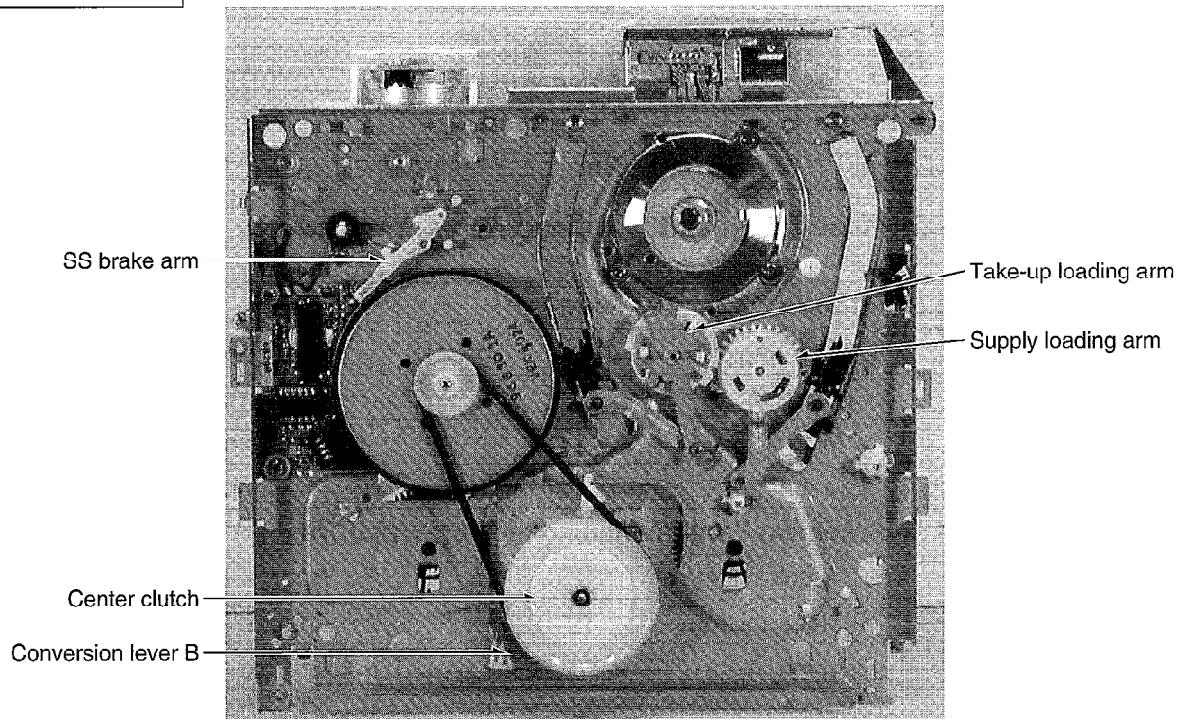
Number of Gear Phase Alignment Point	
G2 Mechanism	12 Alignment Points
G Mechanism	12 Alignment Points
K Mechanism	6 Alignment Points
Z Mechanism	4 Alignment Points
Number of Replacement Parts' (including the Screw and Washer)	
G2 Mechanism	Approx. 170 Pieces
G Mechanism	Approx. 150 Pieces
K Mechanism	Approx. 100 Pieces
Z Mechanism	Approx. 70 Pieces

Z Mechanism Components

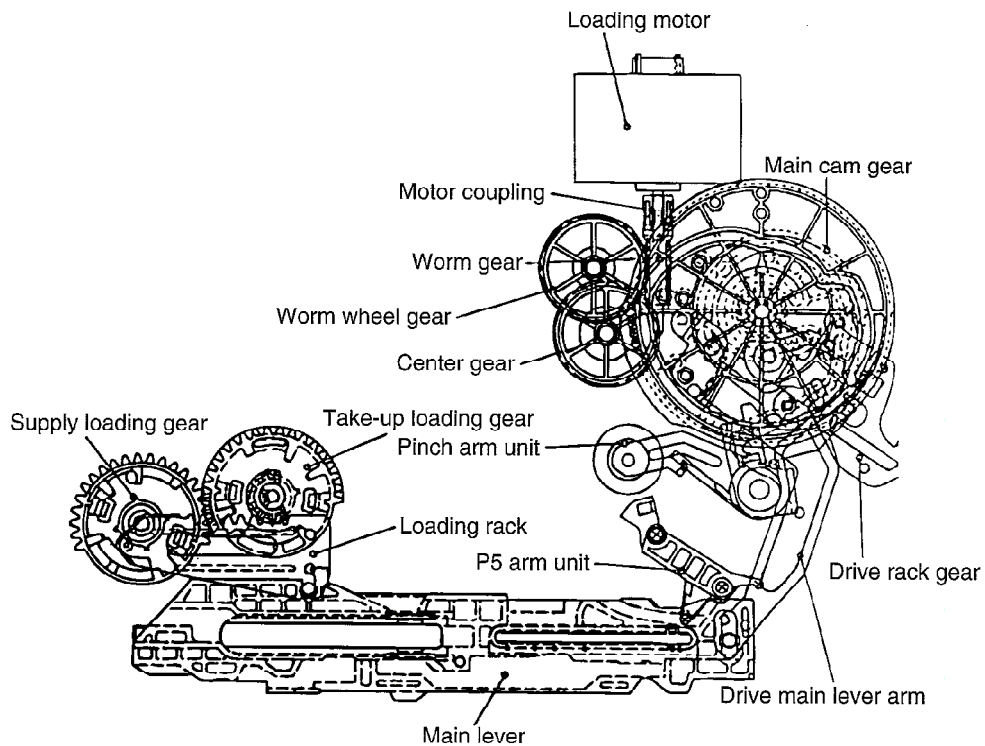
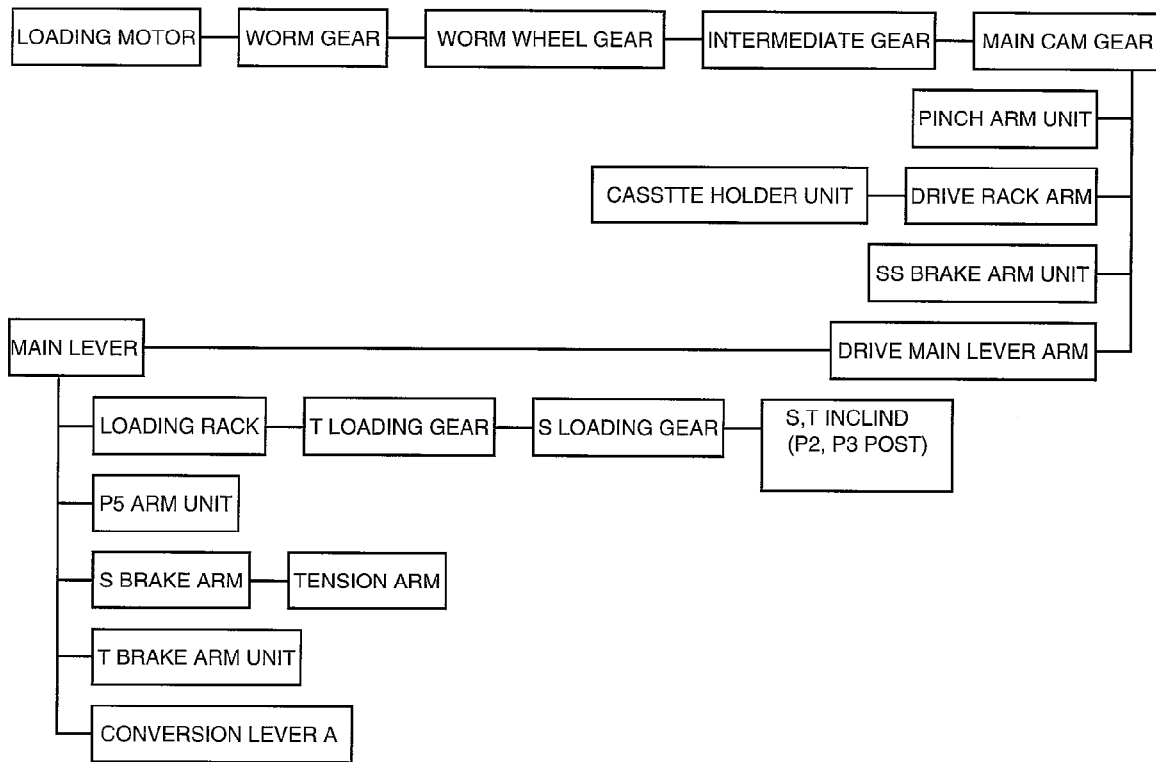
TOP VIEW



BOTTOM VIEW



FLOW CHART OF LOADING MECHANISM



2. REMOVAL OF CASSETTE TAPE

There are 2 ways to remove a cassette tape.

2-1. Removal of compulsory loading

- (1) Press FF, REW and EJECT buttons simultaneously and set the Service Mode 7
- (2) Press STOP button in order to unload the mechanism. (Pay an attention of tape slag)

Service Mode Indication :

7 ※※ ※※ (STOP)→7 00 ※※ (EJECT)

2-2 Removal of manual operation of Main cam gear

- (1) Disconnect the AC power cord and remove Top Panel.
- (2) Rotate Main cam gear to the clockwise and unload the mechanism (Tape is remaining) (Fig. A1).

TOP VIEW

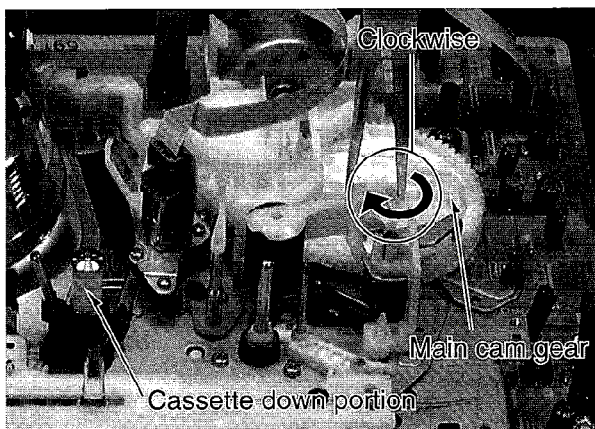


Fig. A1

- (3) Rotate the Pole of Capstan motor to the clockwise from the bottom in order to remove the tape slag (Fig. A2).

BOTTOM VIEW

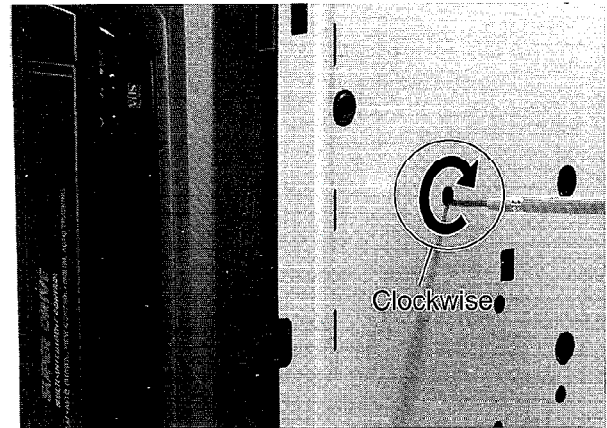


Fig. A2

- (4) Rotate Main cam gear to the clockwise in order to eject the cassette tape.

3. REMOVAL OF CASSETTE HOLDER UNIT & MECHANISM CHASSIS

3-1. Removal of Cassette holder unit

- (1) Remove Top panel and Front panel unit (Fig. B1)

TOP VIEW

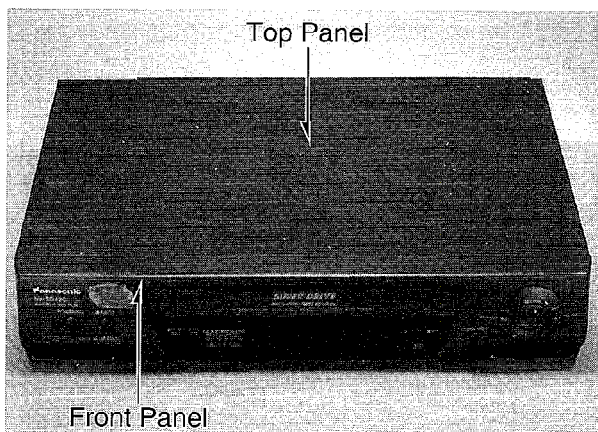


Fig. B1

- (2) Remove Top plate

Remove 4 tabs fixing Top plate and remove Top plate (Fig. B2).

- ※ 4 Tabs should be removed softly due to they are fragile.

TOP VIEW

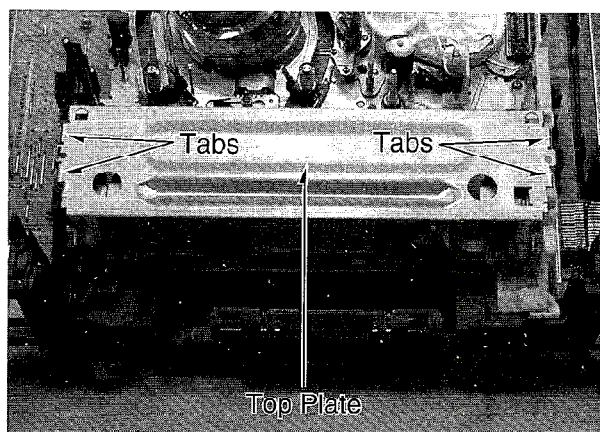


Fig. B2

- (3) Remove Cassette Holder Plate

Keep pressing 2 stoppers on Cassette holder Plate and Press Cassette holder plate to the rear and remove it from Left and Right Side Plate (Fig. B3).

TOP VIEW

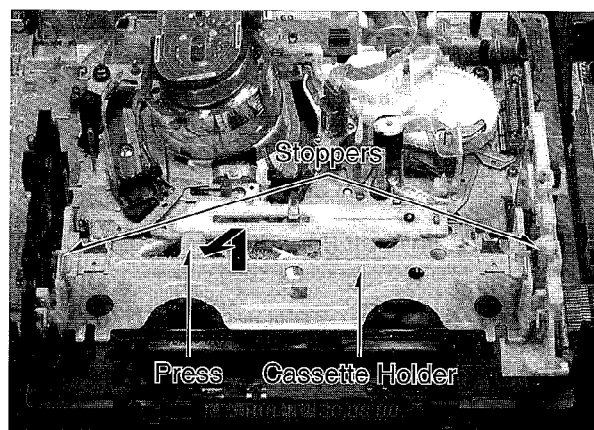


Fig. B3

- (4) Remove Left and Right Side Plate

Remove Conjunction spring of Drive gear.

Remove 3 red screws, 3 tabs and remove Left and Right Side Plate (Fig. B4, B5).

TOP VIEW

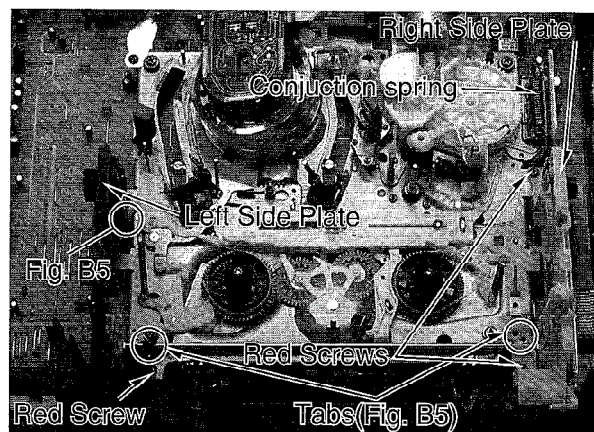


Fig. B4

TOP VIEW

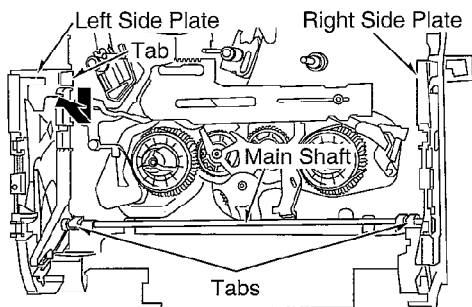


Fig. B5

- (5) Remove Main shaft (Fig. B6)

TOP VIEW

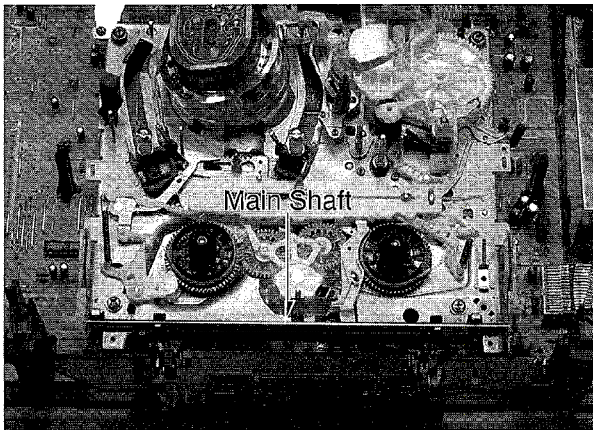


Fig. B6

3-2. Removal of Mechanism chassis

- (1) Remove Mechanism chassis

Disconnect P3001, P2502 and P4001. Remove 5 screws (3 red screws and 2 gold screws) on Mechanism chassis and take out Mechanism chassis (Fig. B7).

TOP VIEW



Fig. B7

4. DISASSEMBLY/ASSEMBLY METHOD FOR MECHANISM

4-1. Disassembly of mechanism

1. Removal of Pinch arm

Unlock the tab (opener space). Remove Opener space and Pinch arm (Fig. C1).

2. Removal of Loading motor unit

Unlock 3 tabs and remove Loading motor unit (Fig. C1 C2)

2 tabs of them located on the bottom of the Mechanism (Fig. C2).

TOP VIEW

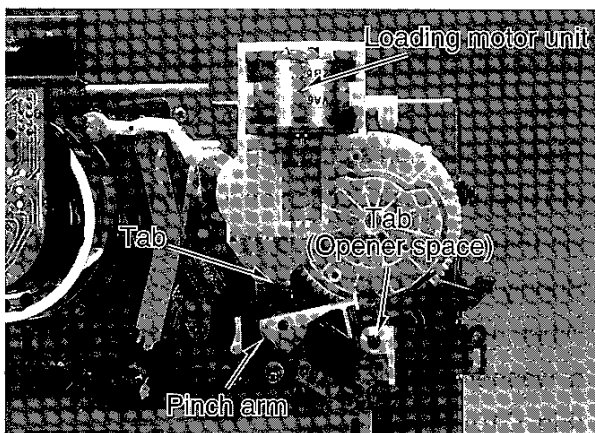


Fig. C1

BOTTOM VIEW

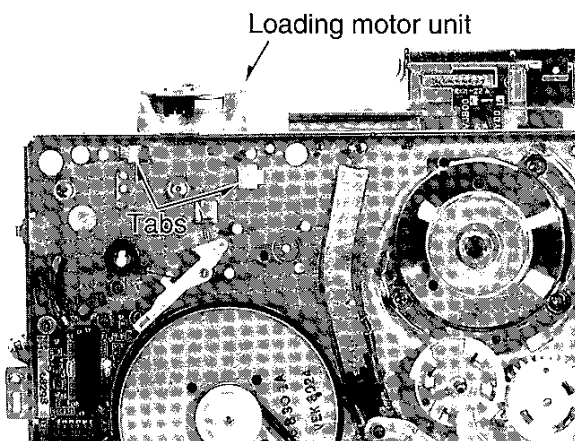


Fig. C2

3. Removal of Main cam gear

Remove Snap washer located on the bottom of Chassis by using retaining ring remover (Fig. C3) and remove Main cam gear (Fig. C4).

BOTTOM VIEW

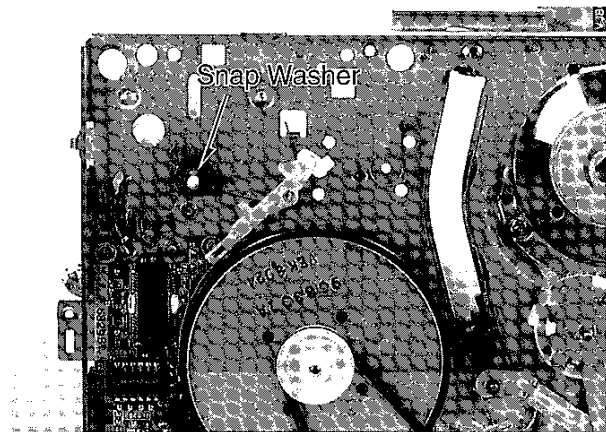


Fig. C3

TOP VIEW

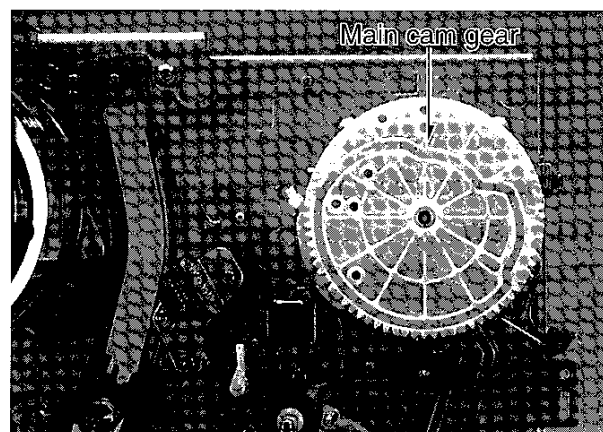


Fig. C4

4. Removal of Drive rack arm

Rotate Drive rack arm to the counterclockwise and remove it (Fig. C5)

TOP VIEW

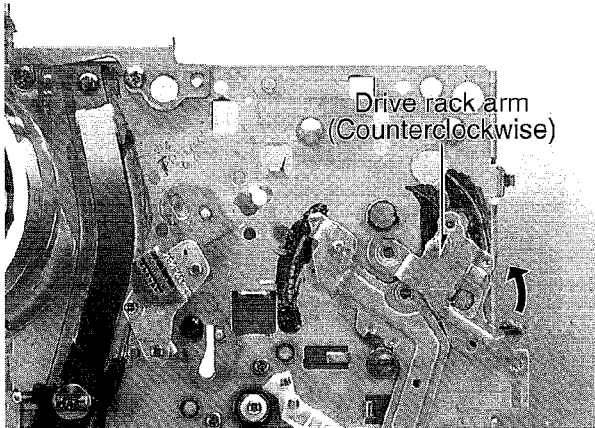


Fig. C5

5. Removal of Main lever, P5 arm and Conversion lever A

Removal cut washer located on the main lever. Unlock 2 tabs of Prism LED and 1 tab on the projection of Chassis while keep lifting the left side of Main lever, and remove Main lever, P5 arm and Conversion lever A (Fig. C6).

※ It is easier to unlock the tabs by using a tweezer.

TOP VIEW

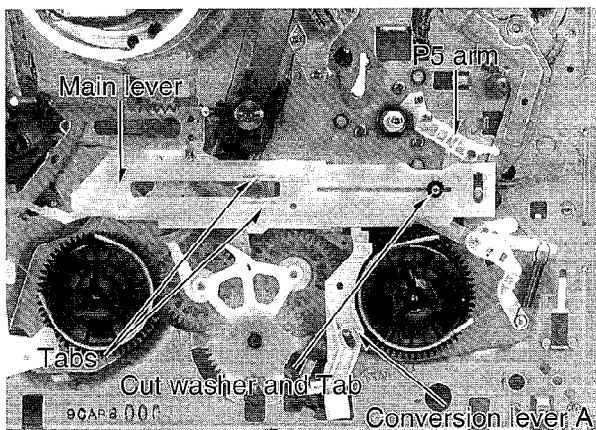


Fig. C6

6. Removal of Drive main lever arm

Rotate Drive main lever arm to the counterclockwise and remove it (Fig. C7).

TOP VIEW

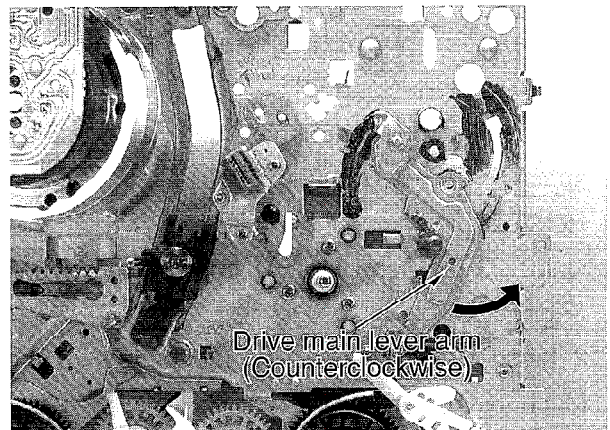


Fig. C7

7 Removal of Tension arm unit and Supply reel table

Remove Tension spring (Fig. C8). Unlock the tab of Tension arm projection on the bottom of Chassis (Fig. C9) and remove Tension arm unit and Supply reel table (Fig. C8).

※ When remove supply reel table, be sure whether a washer attaches on Supply reel table shaft (Fig. C10).

TOP VIEW

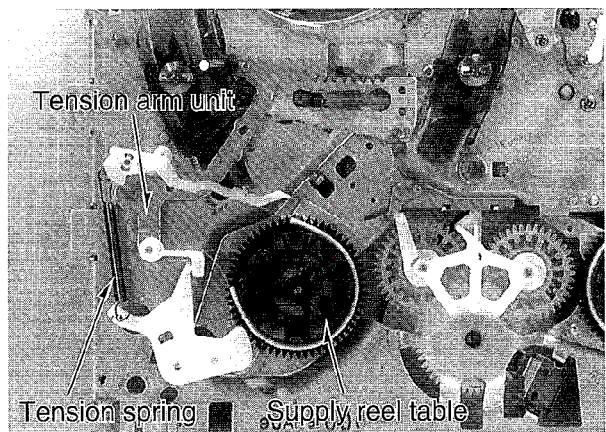


Fig. C8

BOTTOM VIEW

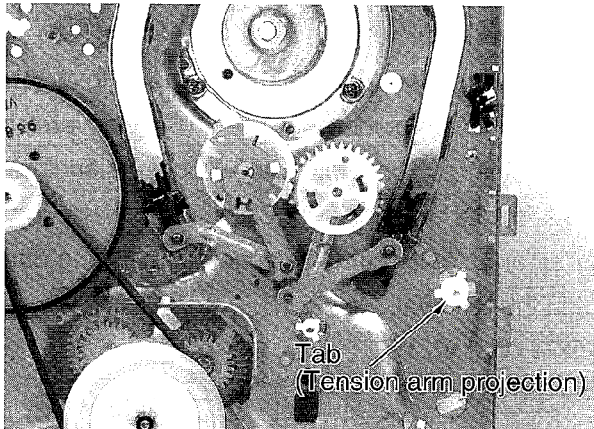


Fig. C9

TOP VIEW

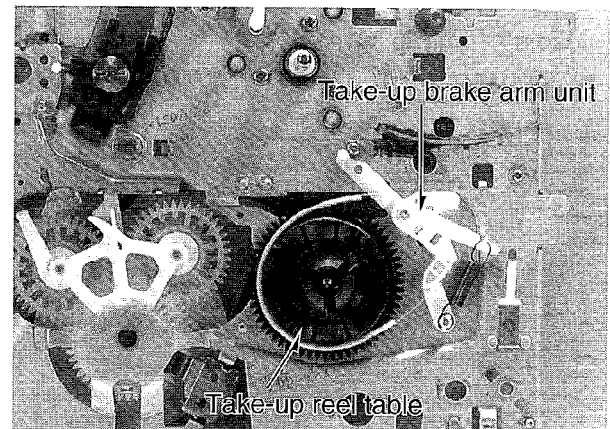


Fig. C11

SIDE VIEW

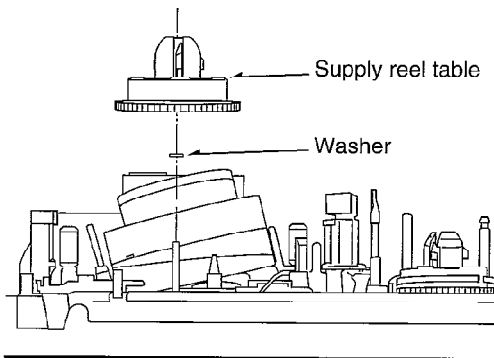


Fig. C10

BOTTOM VIEW

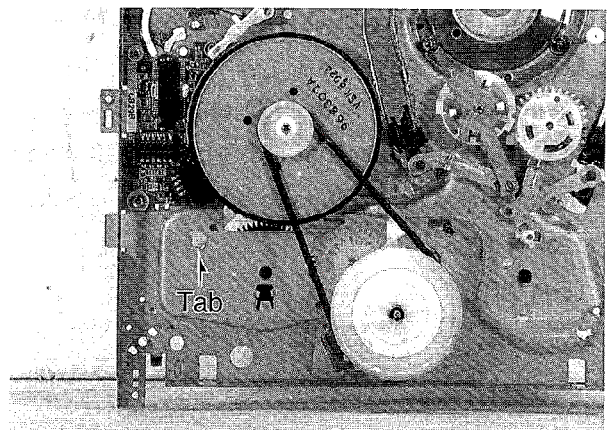


Fig. C12

8 Remove of Take-up brake arm unit and Take-up reel table

Unlock the tab of Take-up brake arm unit from the bottom of Chassis (Fig. C12). Remove Take-up brake arm unit and Take-up reel table (Fig. C11).

- ※ When remove Take-up reel table, be sure whether a washer attaches on Take-up reel table shaft (Fig. C13).

SIDE VIEW

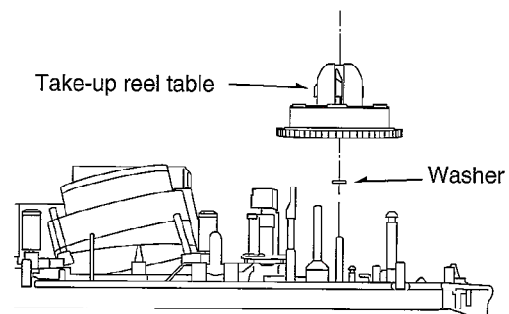


Fig. C13

9. Removal of Take-up & Supply loading arm
Unlock the tab and remove Take-up and Supply loading arm (Fig. C14).

BOTTOM VIEW

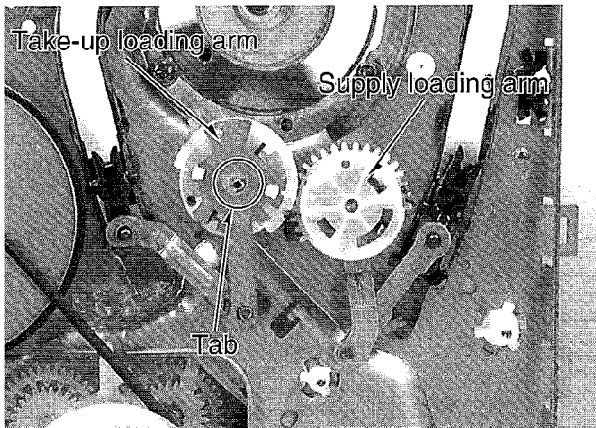


Fig. C14

- 10 Removal of Prism LED, Take-up & Supply shaft holder and Loading rack
Push the tab of Prism LED and remove Prism LED. Remove Take-up and Supply shaft holder from the groove of Chassis and remove Loading rack (Fig. C15).

TOP VIEW

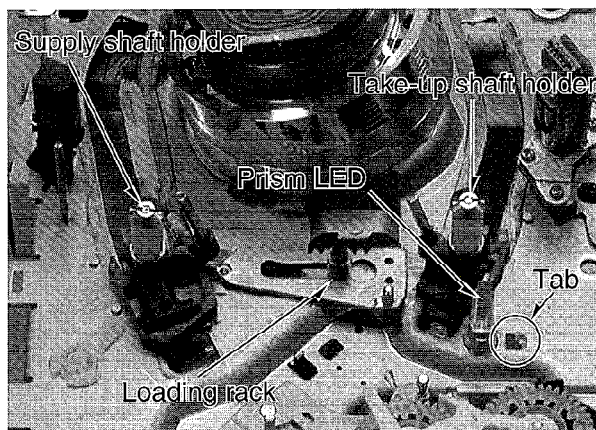


Fig. C15

11. Removal of Center clutch, Conversion gear spring, Conversion gear, Conversion lever B and Idler arm unit

Remove the Belt and the Cut washer (Fig. C16).
Remove Center clutch (Fig. C16) Conversion gear spring, Conversion gear, Conversion lever B and Idler arm unit (Fig. C17).

- ※ Pay an attention of Conversion gear spring during the removal.

BOTTOM VIEW

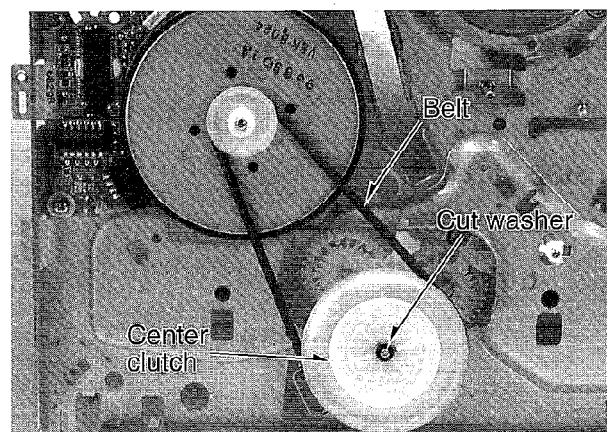


Fig. C16

BOTTOM VIEW

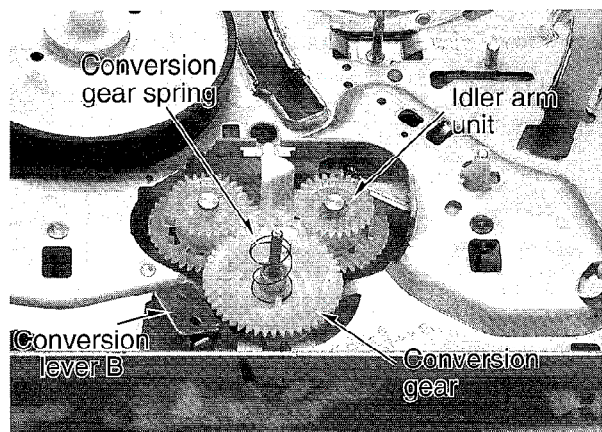


Fig. C17

12. Removal of Capstan unit

Remove 3 gold screws (Fig. C18).

Remove 2 gold screws on the bottom of Chassis (Fig. C19)

Keep moving SS brake arm and remove Capstan unit.

TOP VIEW

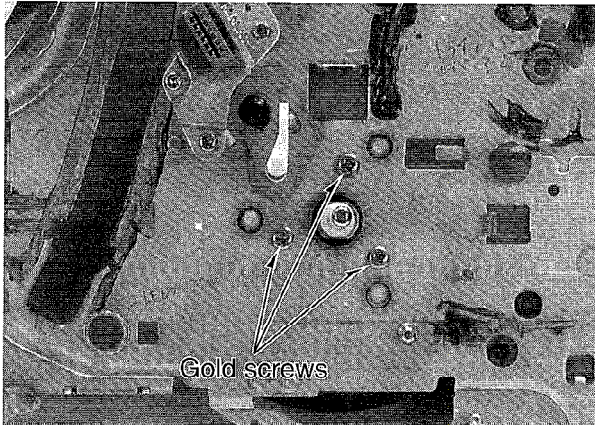


Fig. C18

BOTTOM VIEW



Fig. C19

13. Removal of Cylinder unit

Removal red screw (Fig. C20).

Remove 3 gold screws on the bottom of Chassis and remove Cylinder unit (Fig. C21).

TOP VIEW

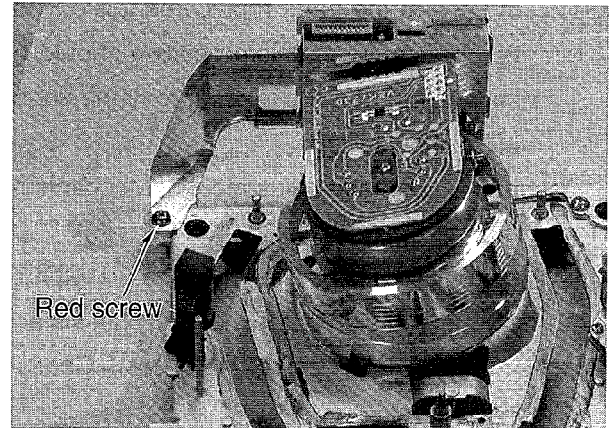


Fig. C20

BOTTOM VIEW

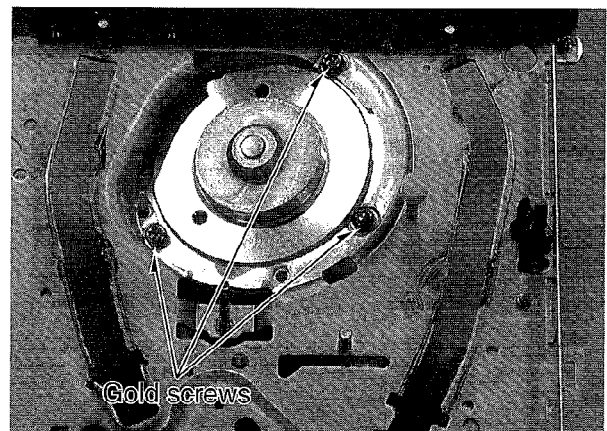


Fig. C21

4-2. Assembly and phase adjustment of mechanism

The gear phase alignment has been performed in the EJECT position and it is crucial for the Z Mechanism to operate correctly.

NOTE: In case of the parts replacement like Position switch, Mechanism position should be set to Eject position in order to fit the phase of Position switch

1 Assembly and phase adjustment of Mechanism

(1) Assembly of Cylinder unit

Cylinder unit should be fixed by 3 screws (GOLD) from the bottom side of Mechanism chassis and red screw on the top side of Mechanism Chassis (Fig. E1, E2).

BOTTOM VIEW

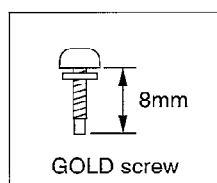
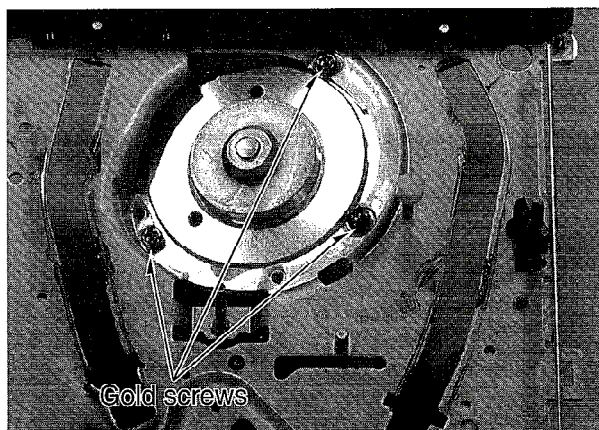


Fig. E1

TOP VIEW

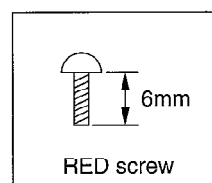
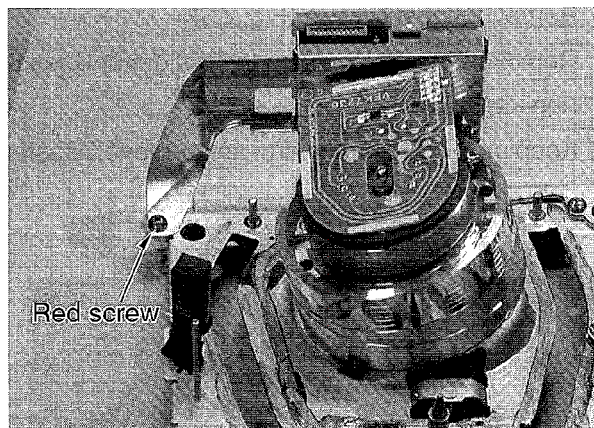


Fig. E2

(2) Assembly of Capstan unit

Move SS brake arm in the direction of arrow (see Fig. E3) and capstan unit should be fixed by 2 screws (GOLD) on the bottom side of Mechanism chassis and 3 screws (GOLD) on the top of Mechanism chassis (Fig. E3 E4)

BOTTOM VIEW

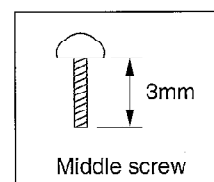
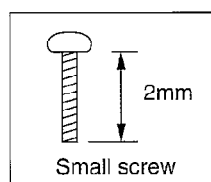
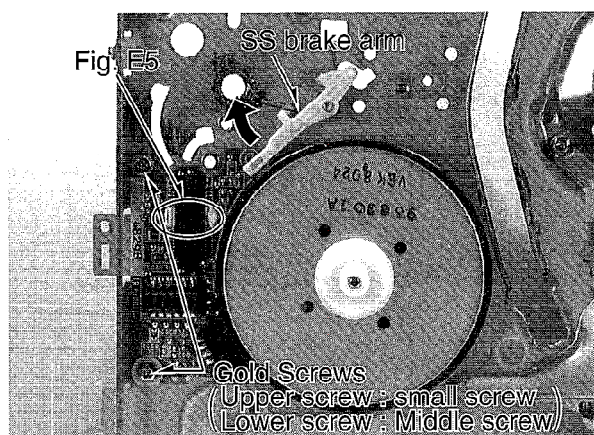


Fig. E3

TOP VIEW

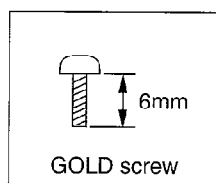
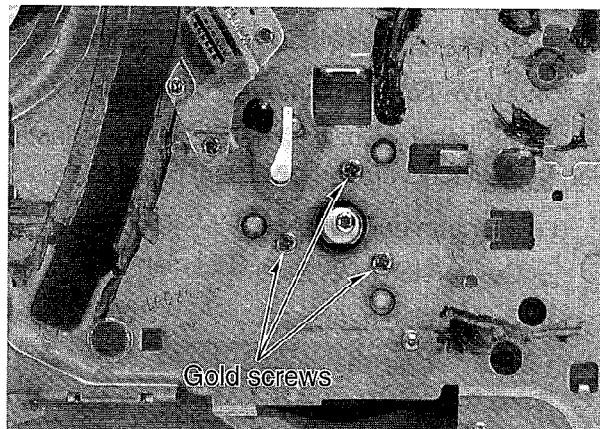


Fig. E4

NOTE: Replacement of Capstan unit and Procedure of applying the silicone grease.

REPLACEMENT OF CAPSTAN UNIT

In case of replacement of the Capstan Unit the Silicone grease have to be applied between the Mechanism chassis and the Drive IC by the following procedure.

Silicone grease No. VFK1301 for radiation of the Drive IC

Silicone grease is used for the radiation of the Drive IC. The heat occurred on the IC is radiated to the Mechanism chassis through the grease. In case of the incomplete radiation, the safety circuit operates depending on the rise of the temperature and it possibility stop the operation of the Drive IC

PROCEDURE OF APPLYING THE SILICONE GREASE

- ① There is a cut-out part at the Drive IC mounting position and the bottom of the IC can be seen from the cut-out part. Apply the Silicon grease to whole the cut-out part of IC as shown in Fig. E5-1 so that the grease is piled 0.3–0.5 mm from the surface of the C.B.A.
- ② Next, from the component side of the C.B.A., apply the Silicon grease so that the grease is piled at the metal of the center of the IC as shown in Fig. E5-2.

Fig. E5-1. Apply the Silicon grease so that the grease is piled 0.3–0.5 mm from the surface of the C.B.A.

Fig. E5-2. Apply the Silicon grease at the metal of the center of the IC.

SIDE VIEW

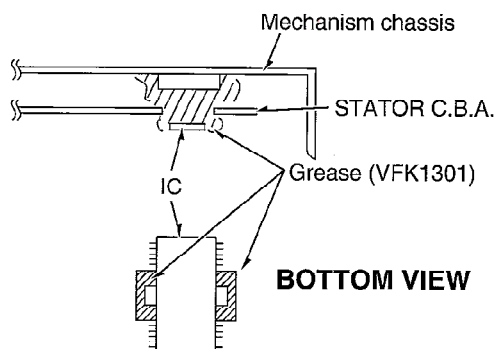


Fig. E5

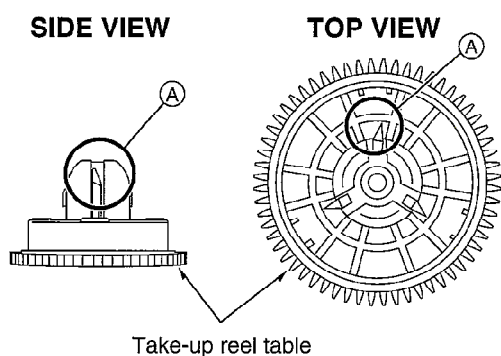


Fig. E11

(7) Assembly of Supply reel table and Tension arm unit

Install washer (Fig. E13) and Supply reel table. Insert Tension arm unit to Tension arm projection and hang Tension spring with Supply spring arm projection (Fig. E12).

※1 Pay an attention of Position of the Supply spring arm.

NOTE: The shape between portion A for Take-up reel table and portion B for Supply reel table is different.

Therefore, confirm the shape of portion A and B before mounting reel tables. If Take-up reel table has been confused with Supply reel table and they have been installed, the trouble of reel table rotation slip happens (Fig. E14).

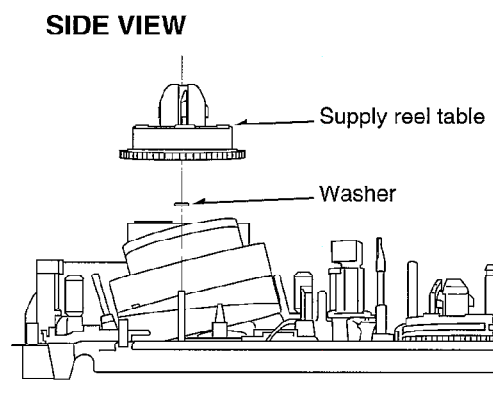


Fig. E13

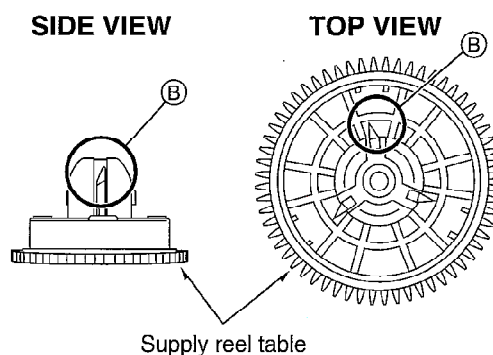


Fig. E14

(8) Assembly of Drive main lever arm

Install Drive main lever arm so that Drive main lever arm fits to the groove of Chassis.

And rotate Drive main lever arm to the clockwise in order to adjust the phase between the hole of the position fixture and the penetration hole of Chassis (Fig. E15).

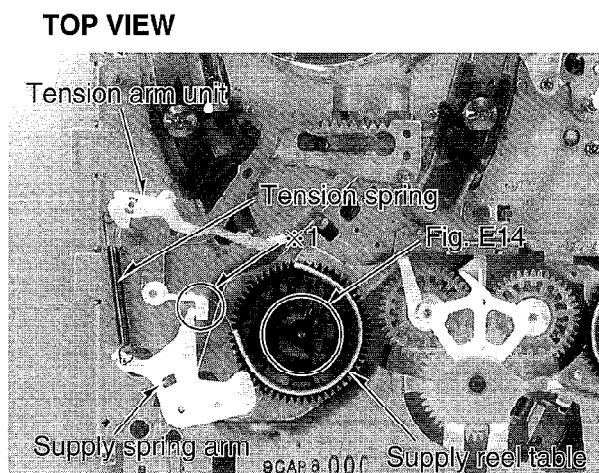


Fig. E12

TOP VIEW

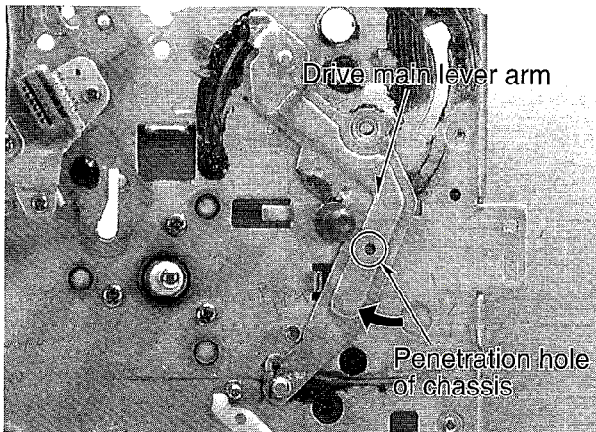


Fig. E15

TOP VIEW

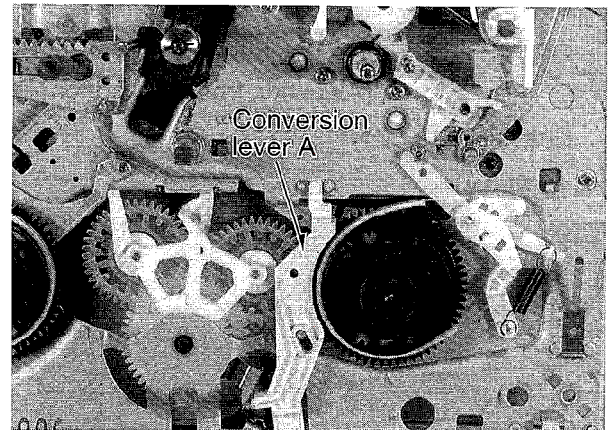


Fig. E17

(9) Assembly of Conversion lever A, P5 arm and Main lever

Install Conversion lever A and P5 arm (Fig. E16, E17).

Adjust the phase of Main lever so that Main lever fits the projection of Loading rack.

Main lever has to be locked at the projection of Chassis by 2 tabs of Prism LED (Fig. E16).

- ※ Conversion lever A, P5 arm, Supply brake arm unit and the projection of Take-up brake arm have to be installed to the groove under the Main lever (Fig. E18).

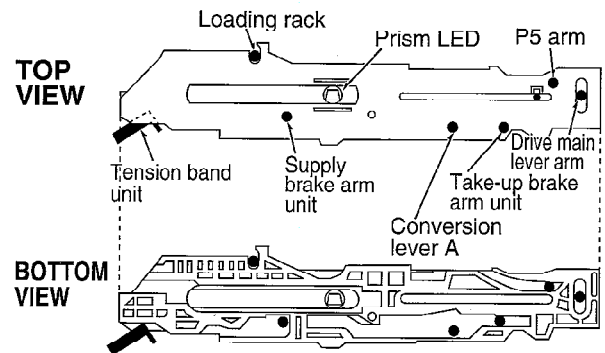


Fig. E18

TOP VIEW

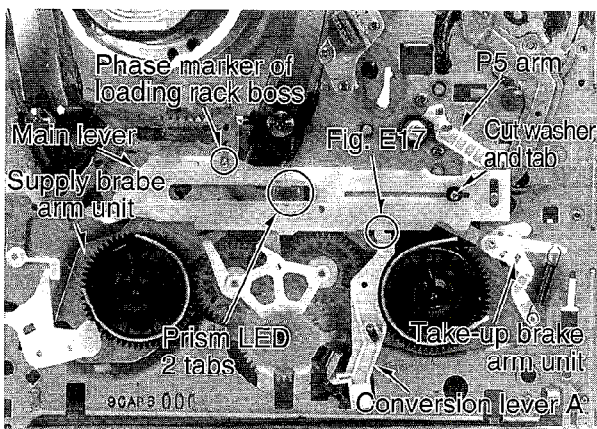


Fig. E16

(10) Assembly of Drive rack arm

Install Drive rack arm so that Drive rack arm fits the groove of Chassis and rotate it to the clockwise in order to fit the penetration hole of Chassis (Fig. E19)

TOP VIEW

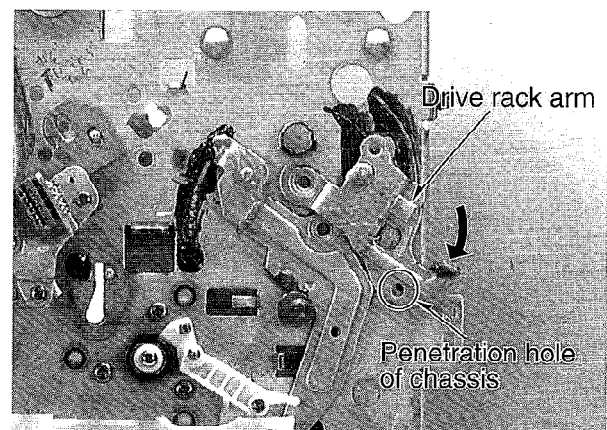


Fig. E19

(11) Assembly of Main cam gear

Install Main cam gear so that Main cam gear fits the penetration hole of Chassis (Fig. E20) and fix it by the snap washer from the bottom of Chassis (Fig. E21).

TOP VIEW

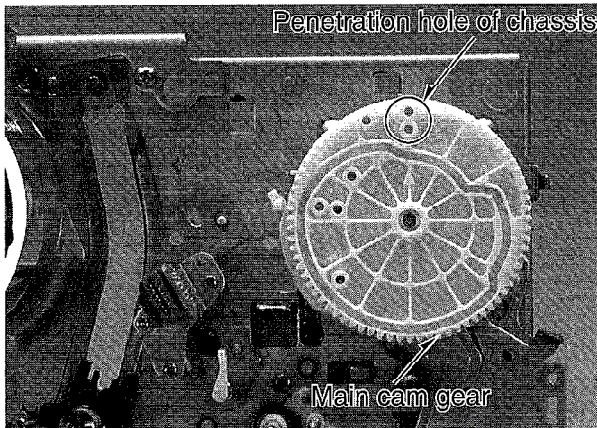


Fig. E20

BOTTOM VIEW

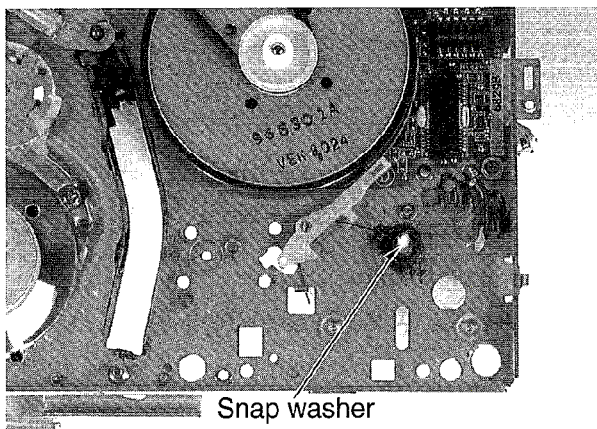


Fig. E21

(12) Assembly of Loading motor unit

Install Loading motor unit so that Loading motor unit fits the groove of Chassis (Fig. E22).

(13) Assembly of Pinch arm

Put Pinch arm together and install Opener space to fix Pinch arm (Fig. E22).

TOP VIEW

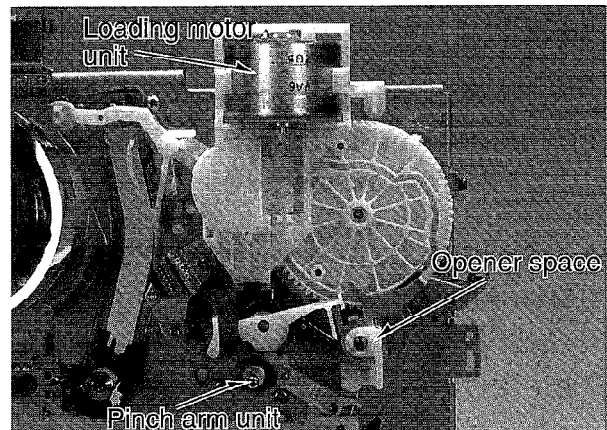


Fig. E22

4-3 Assembly of mechanism chassis

1 Assembly of Mechanism chassis

(1) Adjust the phase of Position switch in Main C B A..

Rotate Position switch until the click point. The projection of Position switch should be set to just above (Fig. F1)

TOP VIEW

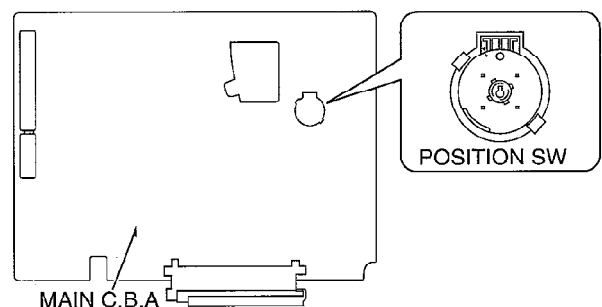


Fig. F1

(2) Assembly of Mechanism chassis

Put Mechanism chassis on Main C.B.A. and fix it by 5 screws (3 red screws and 2 gold screws).

Connect P3001, P2502 and P4001 (Fig. F2)

TOP VIEW

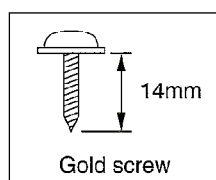
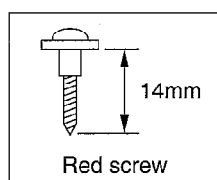
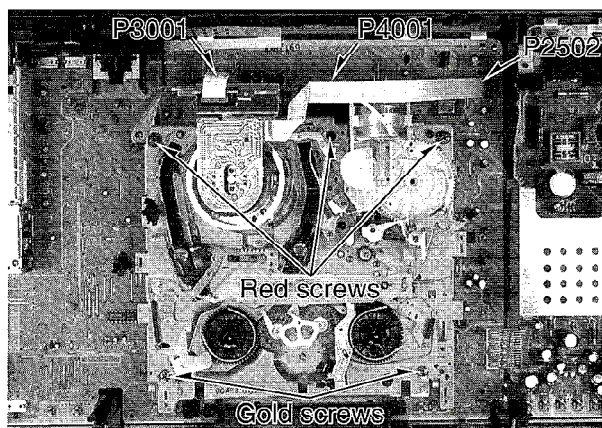


Fig. F2

※ The red screws has a gap among the chassis.
Therefore be careful not to tighten too much.

2. Assembly of Cassette holder unit

(1) Assembly of Main shaft

Install Main shaft so that Main shaft fits the groove of Chassis (Fig. F3)

TOP VIEW

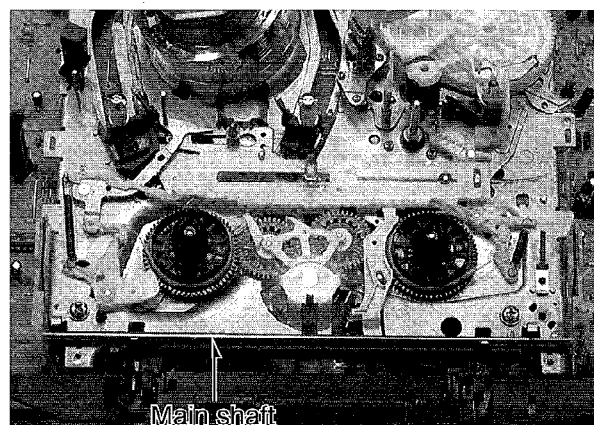


Fig. F3

(2) Assembly of Left & Right side plate

Install Left side plate so that Left side plate fits the groove of Chassis and fix it by the red screws.

After adjustment the phase of waper arm and Drive rack (Fig. F5), install Right side plate so that Right side plate fits the groove of Chassis and fix it by 2 red screws. Hang Conjunction spring on the projection of Drive rack arm (Fig. F4, F5).

TOP VIEW

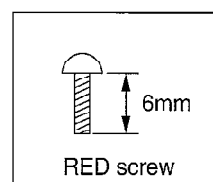
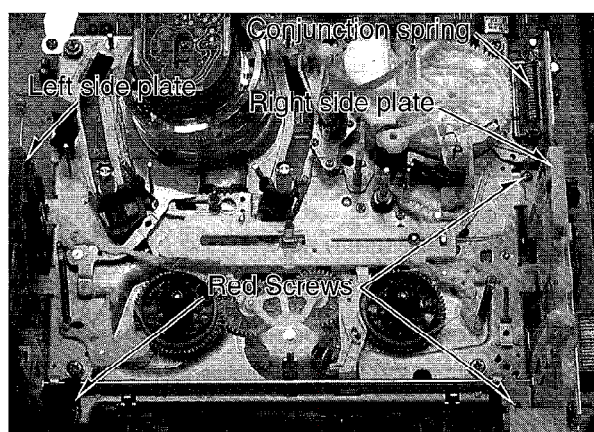


Fig. F4

SIDE VIEW

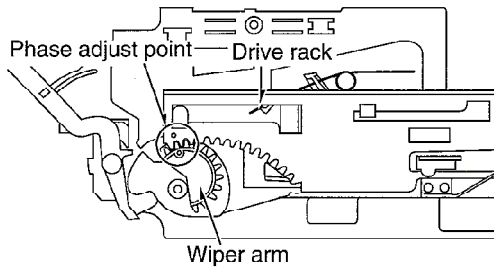


Fig. F5

TOP VIEW

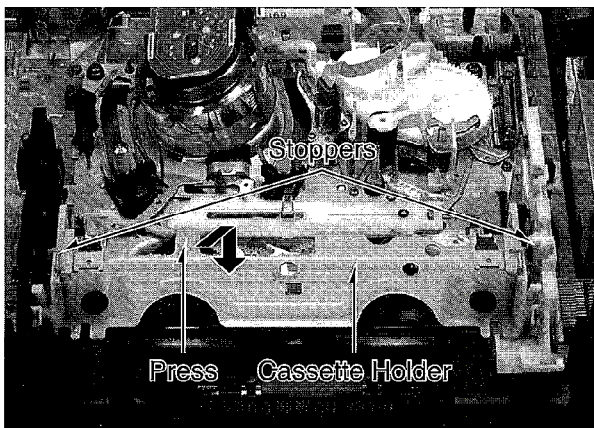


Fig. F6

(3) Assembly of Cassette holder

Install Cassette holder so that Cassette holder fits the groove of Waper arm installed in Main shaft (Fig. F6, F7).

TOP VIEW

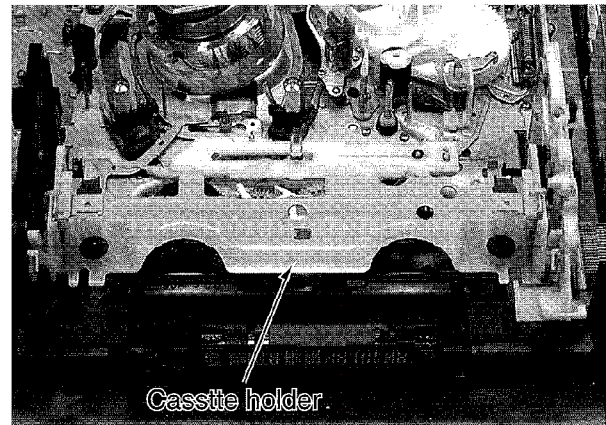


Fig. F7

(4) Assembly of Top plate

Install Top plate so that Top plate fits the groove of Left and Right side plate.

- ※ Fix Top plate by tightening screw when the tabs of Left and Right side plate broke (Fig. F8)

TOP VIEW

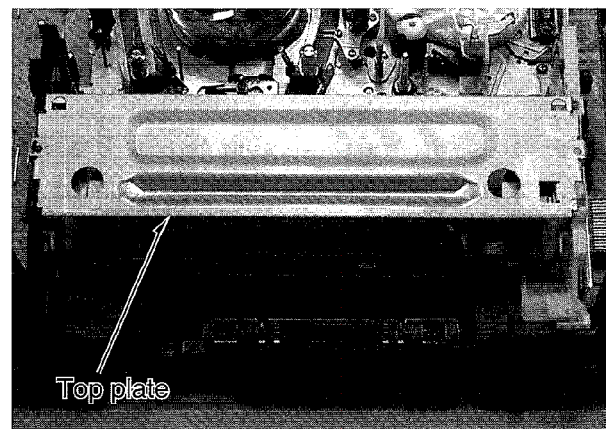


Fig. F8

(5) Install Front panel unit and Top panel

Parts Access Flow Chart

MECHANISM UNIT

TOP

- OPENER SPACE
Tab...2pcs
- LOADING MOTOR UNIT
Tab...3pcs
- TAKE-UP LOADING ARM
Tab...1pc.
- TENSION ARM UNIT
Tab...2pcs
- SUPPLY REEL TABLE
Washer...1pc.
- DRIVE MAIN LEVER ARM

TOP

- MAIN LEVER
Cut washer...1pc.
Tab...3pcs
- LOADING RACK
- PRISM LED
Tab...1pc.
- SUPPLY SHAFT HOLDER
- TAKE-UP SHAFT HOLDER

TOP

- CONVERSION LEVER A
- TAKE-UP REEL TABLE
Washer...1pc.

TOP

- SS BRAKE ARM

TOP

- TAKE-UP BRAKE ARM UNIT
Tab...1pc.

TOP

- P5 ARM

TOP

- DRIVE RACK ARM

TOP

- MAIN CAM GEAR
Snap washer...1pc.

TOP

- SUPPLY LOADING ARM

TOP

- CONVERSION LEVER B
Tab...2pcs

TOP

- IDLER ARM UNIT

TOP

- CONVERSION GEAR
Spring...1pc.

TOP

- CENTER CLUTCH
Cut washer...1pc.

TOP

- PINCH ARM

TOP

- OPENER SPACE
Tab...2pcs

TOP

- LOADING MOTOR UNIT
Tab...3pcs

TOP

- TAKE-UP LOADING ARM
Tab...1pc.

TOP

- TENSION ARM UNIT
Tab...2pcs

TOP

- SUPPLY REEL TABLE
Washer...1pc.

TOP

- DRIVE MAIN LEVER ARM

TOP

- MAIN LEVER
Cut washer...1pc.
Tab...3pcs

TOP

- LOADING RACK

TOP

- PRISM LED
Tab...1pc.

TOP

- SUPPLY SHAFT HOLDER

TOP

- TAKE-UP SHAFT HOLDER

TOP

- CONVERSION LEVER A

TOP

- TAKE-UP REEL TABLE
Washer...1pc.

TOP

- SS BRAKE ARM

TOP

- TAKE-UP BRAKE ARM UNIT
Tab...1pc.

TOP

- P5 ARM

TOP

- DRIVE RACK ARM

TOP

- MAIN CAM GEAR
Snap washer...1pc.

TOP

- SUPPLY LOADING ARM

TOP

- CONVERSION LEVER B
Tab...2pcs

TOP

- IDLER ARM UNIT

TOP

- CONVERSION GEAR
Spring...1pc.

TOP

- CENTER CLUTCH
Cut washer...1pc.

TOP

- PINCH ARM

TOP

- OPENER SPACE
Tab...2pcs

TOP

- LOADING MOTOR UNIT
Tab...3pcs

TOP

- TAKE-UP LOADING ARM
Tab...1pc.

TOP

- TENSION ARM UNIT
Tab...2pcs

TOP

- SUPPLY REEL TABLE
Washer...1pc.

TOP

- DRIVE MAIN LEVER ARM

TOP

- MAIN LEVER
Cut washer...1pc.
Tab...3pcs

TOP

- LOADING RACK

TOP

- PRISM LED
Tab...1pc.

TOP

- SUPPLY SHAFT HOLDER

TOP

- TAKE-UP SHAFT HOLDER

TOP

- CONVERSION LEVER A

TOP

- TAKE-UP REEL TABLE
Washer...1pc.

TOP

- SS BRAKE ARM

TOP

- TAKE-UP BRAKE ARM UNIT
Tab...1pc.

TOP

- P5 ARM

TOP

- DRIVE RACK ARM

TOP

- MAIN CAM GEAR
Snap washer...1pc.

TOP

- SUPPLY LOADING ARM

TOP

- CONVERSION LEVER B
Tab...2pcs

TOP

- IDLER ARM UNIT

TOP

- CONVERSION GEAR
Spring...1pc.

TOP

- CENTER CLUTCH
Cut washer...1pc.

TOP

- PINCH ARM

TOP

- OPENER SPACE
Tab...2pcs

TOP

- LOADING MOTOR UNIT
Tab...3pcs

TOP

- TAKE-UP LOADING ARM
Tab...1pc.

TOP

- TENSION ARM UNIT
Tab...2pcs

TOP

- SUPPLY REEL TABLE
Washer...1pc.

TOP

- DRIVE MAIN LEVER ARM

TOP

- MAIN LEVER
Cut washer...1pc.
Tab...3pcs

TOP

- LOADING RACK

TOP

- PRISM LED
Tab...1pc.

TOP

- SUPPLY SHAFT HOLDER

TOP

- TAKE-UP SHAFT HOLDER

TOP

- CONVERSION LEVER A

TOP

- TAKE-UP REEL TABLE
Washer...1pc.

TOP

- SS BRAKE ARM

TOP

- TAKE-UP BRAKE ARM UNIT
Tab...1pc.

TOP

- P5 ARM

TOP

- DRIVE RACK ARM

TOP

- MAIN CAM GEAR
Snap washer...1pc.

TOP

- SUPPLY LOADING ARM

TOP

- CONVERSION LEVER B
Tab...2pcs

TOP

- IDLER ARM UNIT

TOP

- CONVERSION GEAR
Spring...1pc.

TOP

- CENTER CLUTCH
Cut washer...1pc.

TOP

- PINCH ARM

TOP

- OPENER SPACE
Tab...2pcs

TOP

- LOADING MOTOR UNIT
Tab...3pcs

TOP

- TAKE-UP LOADING ARM
Tab...1pc.

TOP

- TENSION ARM UNIT
Tab...2pcs

TOP

- SUPPLY REEL TABLE
Washer...1pc.

TOP

- DRIVE MAIN LEVER ARM

TOP

- MAIN LEVER
Cut washer...1pc.
Tab...3pcs

TOP

- LOADING RACK

TOP

- PRISM LED
Tab...1pc.

TOP

- SUPPLY SHAFT HOLDER

TOP

- TAKE-UP SHAFT HOLDER

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- CONVERSION LEVER A

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Washer...1pc.

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- SS BRAKE ARM

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Tab...1pc.

TOP

- P5 ARM

TOP

- DRIVE RACK ARM

TOP

- MAIN CAM GEAR
Snap washer...1pc.

TOP

- SUPPLY LOADING ARM

TOP

- CONVERSION LEVER B
Tab...2pcs

TOP

- IDLER ARM UNIT

TOP

- CONVERSION GEAR
Spring...1pc.

TOP

- CENTER CLUTCH
Cut washer...1pc.

TOP

- PINCH ARM

TOP

- OPENER SPACE
Tab...2pcs

TOP

- LOADING MOTOR UNIT
Tab...3pcs

TOP

- TAKE-UP LOADING ARM
Tab...1pc.

TOP

- TENSION ARM UNIT
Tab...2pcs

TOP

- SUPPLY REEL TABLE
Washer...1pc.

TOP

- DRIVE MAIN LEVER ARM

TOP

- MAIN LEVER
Cut washer...1pc.
Tab...3pcs

TOP

- LOADING RACK

TOP

- PRISM LED
Tab...1pc.

TOP

- SUPPLY SHAFT HOLDER

TOP

- TAKE-UP SHAFT HOLDER

TOP

- CONVERSION LEVER A

TOP

- TAKE-UP REEL TABLE
Washer...1pc.

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- SS BRAKE ARM

TOP

- TAKE-UP BRAKE ARM UNIT
Tab...1pc.

TOP

- P5 ARM

TOP

- DRIVE RACK ARM

TOP

- MAIN CAM GEAR
Snap washer...1pc.

TOP

- SUPPLY LOADING ARM

TOP

- CONVERSION LEVER B
Tab...2pcs

TOP

- IDLER ARM UNIT

TOP

- CONVERSION GEAR
Spring...1pc.

TOP

- CENTER CLUTCH
Cut washer...1pc.

TOP

- PINCH ARM

TOP

- OPENER SPACE
Tab...2pcs

TOP

- LOADING MOTOR UNIT
Tab...3pcs

TOP

- TAKE-UP LOADING ARM
Tab...1pc.

TOP

- TENSION ARM UNIT
Tab...2pcs

TOP

- SUPPLY REEL TABLE
Washer...1pc.</

5. MECHANICAL ADJUSTMENT PROCEDURE

5-1. Tension post position adjustment

Equipment required: Hex. Wrench (VFK0326)

Specification: 50.5 ± 1.5 mm

- (1) Disconnect the AC plug.
- (2) Remove the TOP PLATE.
- (3) Turn the LOADING MOTOR until the loading completes.
- (4) Adjust the hole of Tension Band Fastener by Hex Wrench until the distance between the Tension Post and the center of Supply reel table is 50.5 ± 1.5 mm as shown in Fig. M1.

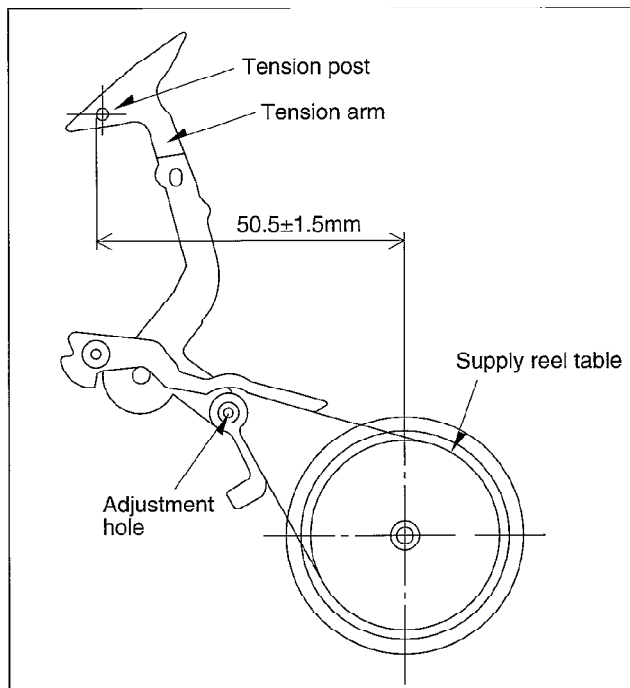


Fig. M1

5-2. Back tension adjustment

Equipment required:

Back Tension Meter (VFK0132)

VHS Cassette tape (180 minutes tape: PAL)

VHS Cassette tape (120 minutes tape: NTSC)

Specification: 22.5–27.5g

- (1) Playback the cassette tape from the beginning and wait until the tape movement get the stabilization. (for approx. 10–20 seconds)
- (2) Insert the Back Tension Meter into the path of a tape, and measure the back tension to be within specification as shown in Fig. M2.

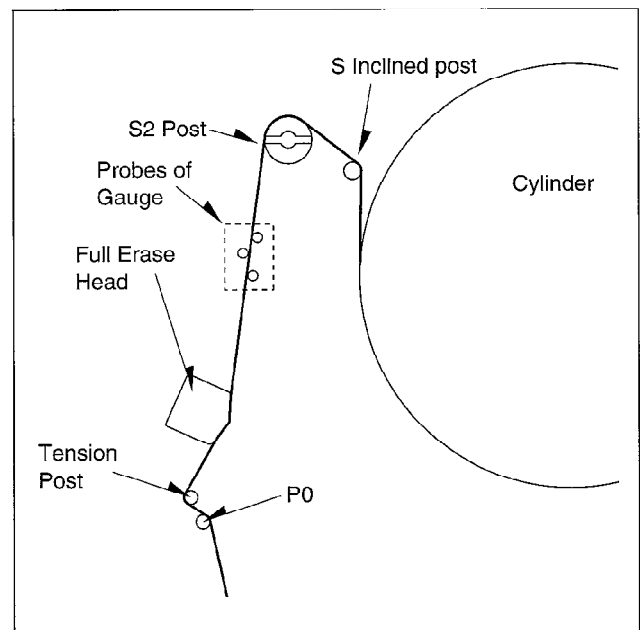


Fig. M2

- (3) If it is out of specification, change the spring notch as shown in Fig. M3.

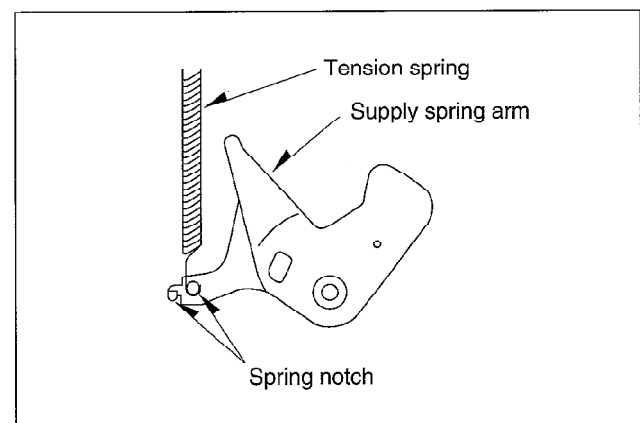


Fig. M3

5-3. P2 and P3 posts adjustment (PREADJUSTMENT)

Equipment Required:

Post Adjustment Screwdriver (VFK0329)

- (1) Remove the Top Plate.
- (2) Turn the Loading Motor until the unloading completes.
- (3) Rotate the P2 and P3 Posts clockwise to the end.
(Fig. M4)
- (4) Rotate the P2 and P3 Posts twice counterclockwise. (Fig. M4)

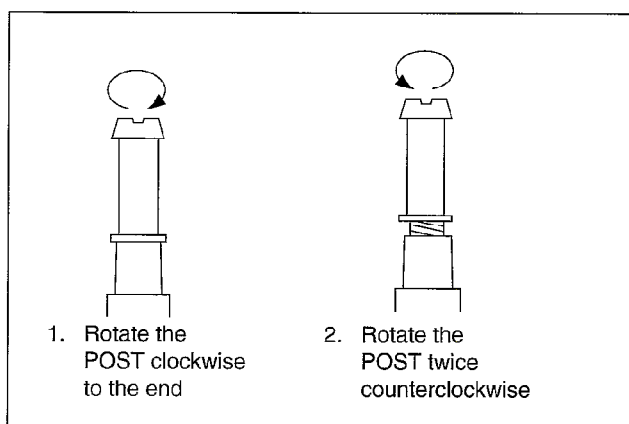


Fig. M4

- (5) Playback the cassette tape and make sure that the edges of the tape are not curling at the bottom or top end of the P2, P3, and P4 Posts as shown in Fig. M5.

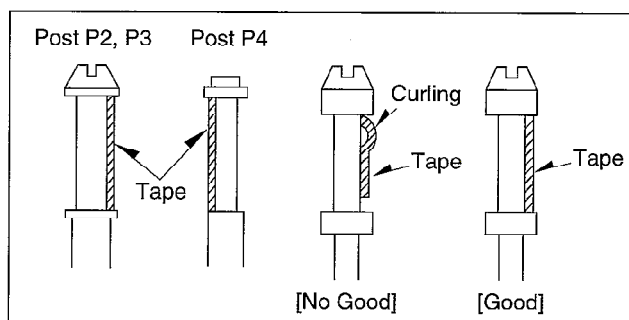


Fig. M5

- (6) If the curling appears, readjusts the P2 and P3 Posts.

5-4. Tape interchangeability adjustment

Carry out the following procedures for Tape Interchangeability Adjustment to do it correctly and smoothly.

- (1) P2 AND P3 POSTS ADJUSTMENT
- (2) ADJUSTMENT OF P4 POST
- (3) HEIGHT ADJUSTMENT OF A/C HEAD
- (4) FINE-ADJUSTMENT OF A/C HEAD
- (5) ADJUSTMENT OF X-VALUE
(PREADJUSTMENT)
- (6) FINE-ADJUSTMENT OF X-VALUE

If the Tape Interchangeability Adjustment is not perfect, repeat the above procedures from (1) to (6).

CAUTIONS: To make an Adjustment Mode for Tape Interchangeability, press the FF, REW and EJECT buttons simultaneously 3 times to set the Service Mode 2.

NOTE: Cleaning the Tape Transport path before adjusting of Tape Interchangeability. The detail portion is shown below.

P0 Post, Tension Posts, FE Head, P2 Post, Supply Inclined Post, Cylinder Unit, Take-up Inclined Post, P3 Post, A/C Head, P4 Post, Pinch Roller, Capstan Shaft, P5 Post. FE Head, Cylinder Unit, A/C Head and Capstan Shaft are more important parts and pay an attention to clean them.

5-4-(1). P2 AND P3 POSTS ADJUSTMENT

Equipment required:

Alignment Tape (PAL/SECAM: VFJ8125H3F)

(NTSC: VFM8080HQFP)

Post Adjustment Screwdriver (VFK0329)

(1) Connect the oscilloscope to the output of the Head Amp as shown in Fig. M6.

NOTE: To get a stable waveform of the Head Amp output (observation point TW3001 and TW2001 located on Main C.B.A.) on the oscilloscope, use the head switching pulse as a triggering signal as shown in Fig. M6.

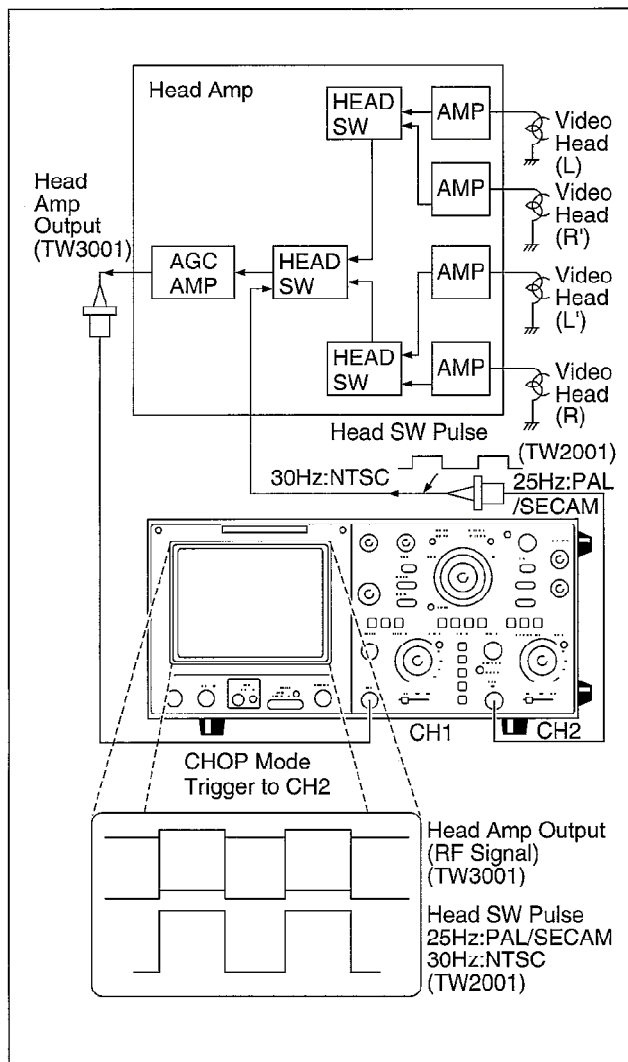


Fig. M6 Connect of Oscilloscope

(2) Playback the Alignment Tape.

(3) If the RF envelope appears like example "A" or "B" in Fig. M7, then adjustment of the tape guide post (P2: Entrance) is necessary.

(4) Adjust the tape guide post (P2) with the post adjustment screwdriver so that the RF envelope waveform at the entrance portion becomes flat as shown in Fig. M7 "C".

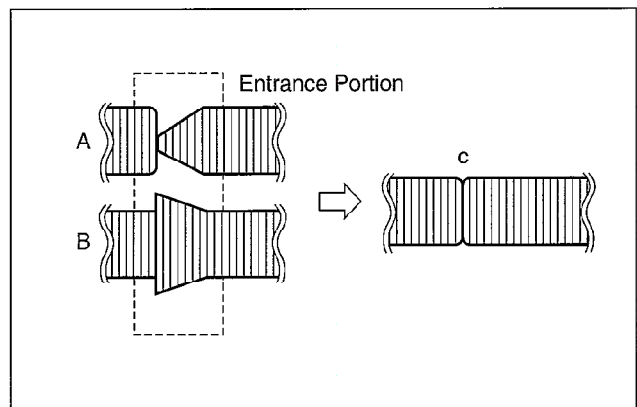


Fig. M7

(5) If the RF envelope appears like "D" or "E" in Fig. M8, then adjustment of the tape guide post (P3: Exit) is necessary.

(6) Adjust the tape guide post (P3) in the same manner as the P2 post so that the exit portion becomes flat as shown in Fig. M8 "F".

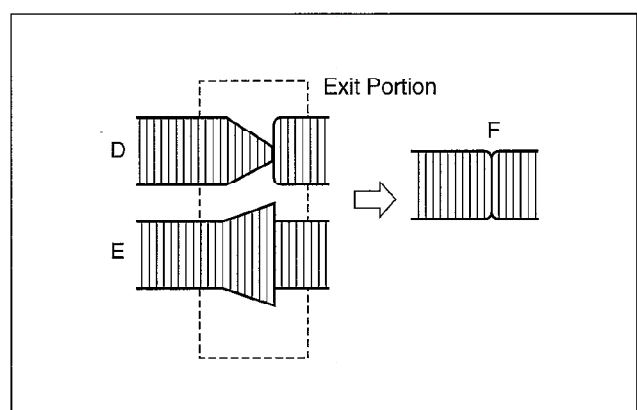


Fig. M8

- (7) Keep pressing the tracking up/down (\wedge or \vee) buttons on the remote controller unit. The output envelope should vary nearly parallel with other condition as shown in Fig. M9.
- (8) Set the tracking control into center fix position by pressing the tracking up/down (\wedge and \vee) simultaneously and adjust for maximum RF envelope, whilst being as flat as possible.

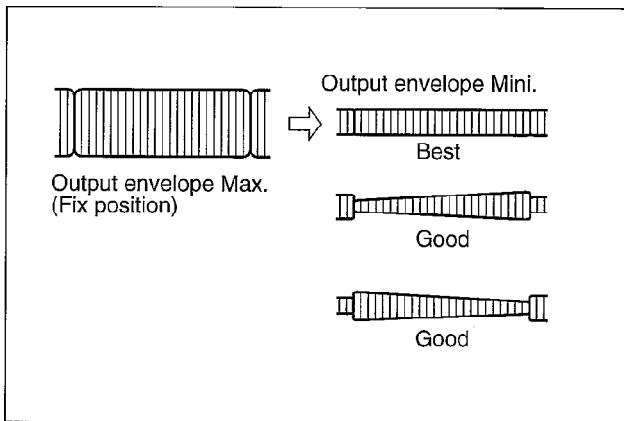


Fig. M9

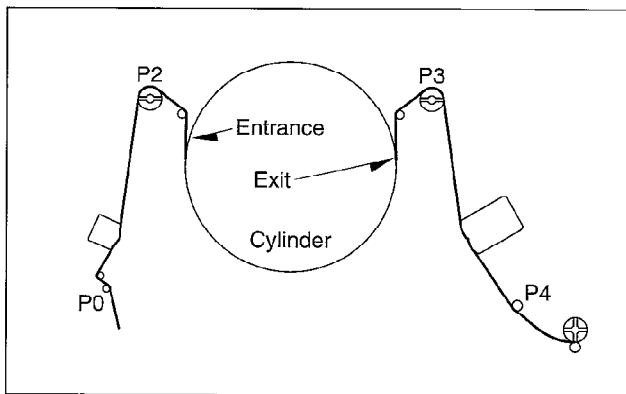


Fig. M10 Loading of Posts

5-4-(2). ADJUSTMENT OF P4 POST

- (1) Install A/C Head on the Mechanism Chassis by one screw.
- (2) Playback the Alignment Tape.
- (3) Rotate the screw (A) or (B) until the wrinkle appears on the lower edge of tape at P4 Post.
- (4) Rotate the screw (A) or (B) until the wrinkle just disappears on the lower edge of tape at P4 Post.
- (5) Connect the oscilloscope to audio output terminal.
- (6) Rotate the screw (C) until audio signal is maximized.

NOTE: 1. The relation between the rotation direction of screws (A) and (B) and the condition of wrinkle on the lower edge at P4 Post as shown in Fig. M11.

2. Make sure that there is not the inclined wrinkle between P4 Post and Pinch Roller.

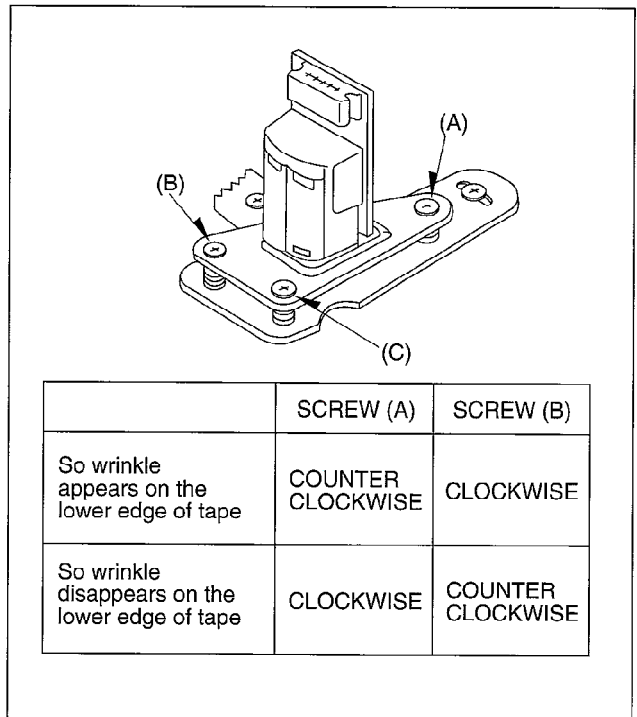


Fig. M11

5-4-(3). HEIGHT ADJUSTMENT OF A/C HEAD

<When moving the A/C Head up>

- (1) Rotate the screw (A) counterclockwise until the wrinkle appears on the lower edge of tape at P4 Post.
- (2) Rotate the screw (B) counterclockwise until the wrinkle just disappears on the lower edge of tape at P4 post.
- (3) Rotate the screw (C) counterclockwise until the audio signal is maximized.

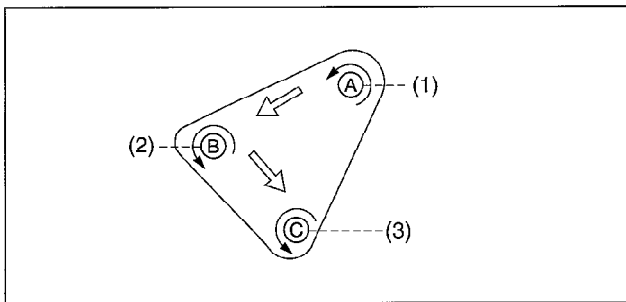


Fig. M12

<When moving the A/C Head down>

- (1) Rotate the screw (B) clockwise until the wrinkle appears on the lower edge of tape at P4 Post.
- (2) Rotate the screw (A) clockwise until the wrinkle just disappears on the lower edge of tape at P4 post.
- (3) Rotate the screw (C) clockwise until the audio signal is maximized.

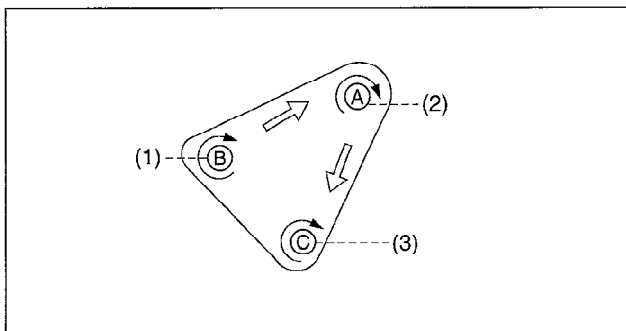


Fig. M13

5-4-(4). FINE-ADJUSTMENT OF A/C HEAD

- (1) Connect the oscilloscope to the output of the Head Amp as shown in Fig. M6.
- (2) Playback the Alignment Tape.
- (3) Make sure that the condition of the wrinkle at P4 Post. If the condition of the wrinkle is out of specification, P4 Post adjustment has to be performed as follows.

Turn the screw (A) counterclockwise until the wrinkle appears on the lower edge of tape at P4 Post.

Turn the screw (A) clockwise until the wrinkle disappears on the lower edge of tape at P4 Post.

- (4) Turn the screw (C) until the audio signal is maximized.

NOTE: Make sure that the audio output does not increase when push the upper and lower edges of tape around A/C Head.

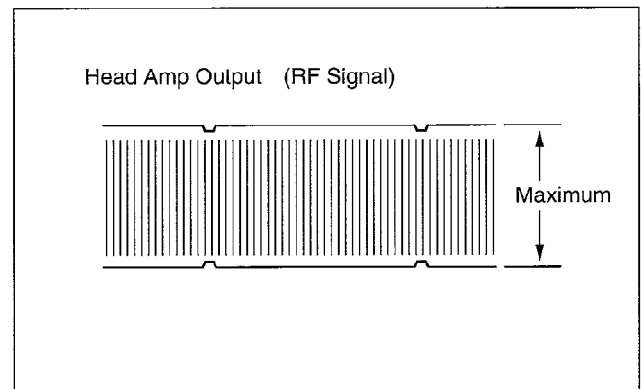


Fig. M14

5-4-(5). ADJUSTMENT OF X-VALUE (PREADJUSTMENT)

Equipment required:

Fine Adjustment Gear Drive (VFK0330)

Specification: Less than 15 msec.

- (1) Connect the oscilloscope to the audio output and the video output. Both output signals should be fixed by the external trigger.

- (2) Playback the Alignment Tape and set the tracking control into center fix position.
- (3) Adjust A/C Head position by the Fine Adjustment Gear Driver (VFK0330) to meet the signal fault portion of the audio output and the video output signals (Less than 15 msec.).
- (4) After meeting the signal fault portion, adjust A/C Head position by the Fine Adjustment Gear Driver (VFK0330) until the video envelope is maximized.

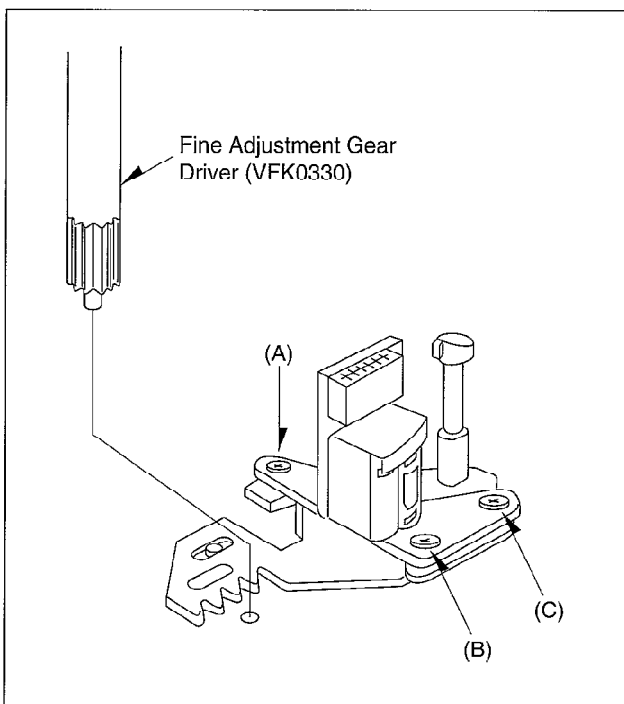


Fig. M15

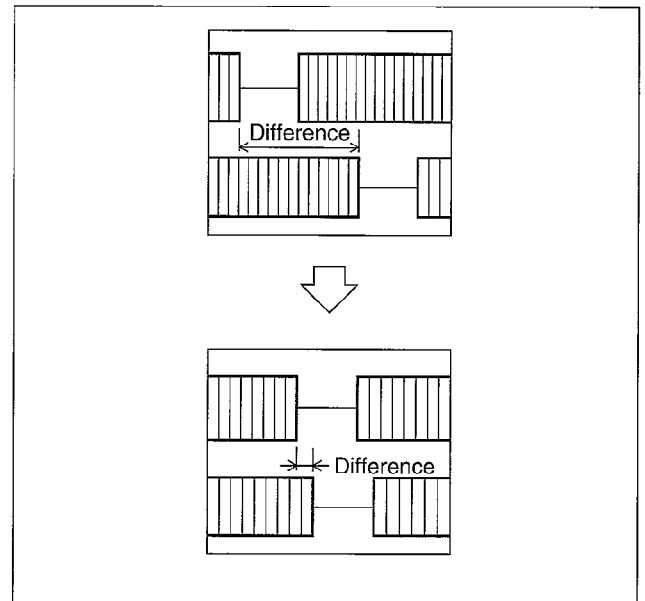


Fig. M16

5-4-(6). FINE-ADJUSTMENT OF X-VALUE

Equipment required:

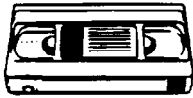
Fine Adjustment Gear Drive (VFK0330)

- (1) Connect the oscilloscope to the audio output and the video output. Both output signals should be fixed by the external trigger.
- (2) Playback the alignment tape and set the tracking control into center fix position.
- (3) Adjust A/C Head position by the Fine adjustment Gear Driver (VFK0330) until the video envelope level is maximized at the tracking center fix position.

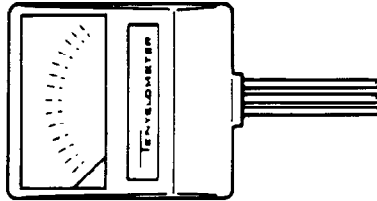
NOTE: During X-Value Fine Adjustment, in case the video envelope level became 0, Preadjustment of X-value should be adjusted again due to it is possibility to vary the X-value adjustment.

Servicing Fixtures & Tools

VFJ8125H3F
PAL VHS Alignment Tape
VFM8080HQFP
NTSC VHS Alignment Tape



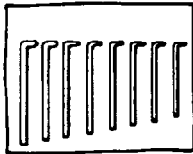
VFK0132
Back Tension Meter
(Tentelometer, Made in U.S.A.)



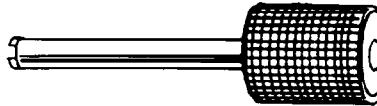
VFK0335
Retaining Ring Remover
(3mm/4mm)



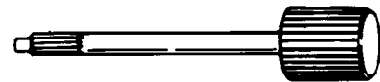
VFK0326
Hex. Wrench Set
(0.7, 0.9, 1.2, 1.5, 1.6, 2.0, 2.4, 3.0mm)



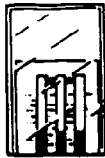
VFK0329
Post Adjustment Screwdriver



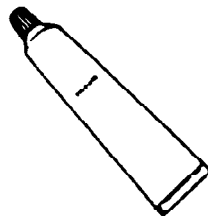
VFK0330
Fine Adjustment Gear Driver



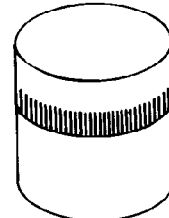
VFK27
Hand Cleaning Stick



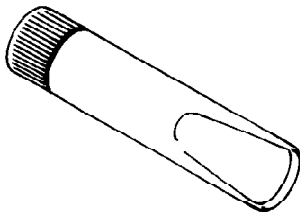
VFK1024
Morlytone Grease



VFK1298
Floil Grease



VFK1301
Silicone Grease



6. SELF-TEST INDICATION DISPLAY

This VTR has a self-diagnosis and display function. If the VTR detects trouble during installation or during use, one of the following fault indication codes will automatically appear in the VTR display. Fault indication codes are displayed in the form of a single English letter followed by two numbrs, as for example "H01".

Note: 1. The indication "U" is displayed on the FIP while power remains on.

2. Otherwise, the indication "H" or "F" is displayed on the FIP, and the power is automatically turned off

When the power is turned on again, the fault indication code will disappear and the unit will retrun to normal display mode (either clock or counter is displayed).

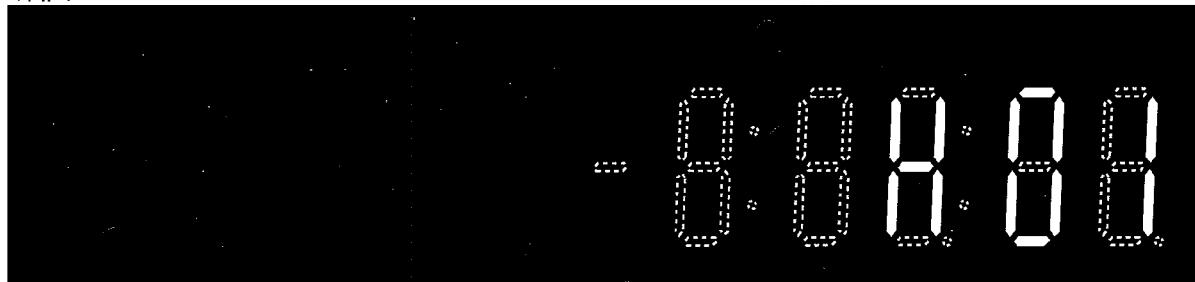
3. This fault indication code will be stored in the Timer microprocessor even with the AC plug disconnected.

The two-digit number portion of the stored fault indication code can be redisplayed in the FIP's "second" display portion (the last 2 digits on the light) by placing the unit is Service Mode Number 2 when turning on Service Information Display as for example "01" or "02" etc.

If a second error occurs, only the most recent error will be displayed and stored.

4. To erase the stored fault indication code data, Press FF, REW and EJECT buttons for 5 seconds.

< FIP >



INDICATION	CAUSE	REMEDY/CHECK
U 10	Dew formation.	Wait until the indication disappears.
U 11	Cylinder clogs during the play mode.	Cleaning the cylinder.
H 01	After cylinder lock is detected, the cylinder does not start rotating again even after tape unloading.	Check the cylinder motor drive circuit.
H 02	Cassette tape is not wound up during tape unloading except Eject mode.	Check the capstan motor drive circuit.
F 03	Mechanism locks during mode transition except Eject mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment. 3. Check the mode switch.
F 04	Mechanism locks during tape unloading.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment.
F 05	Cassette tape is not wound up during tape unloading in Eject mode.	1. Check the capstan motor drive circuit. 2. Check the Supply/Take-up reel pulse.
F 06	Mechanism locks after tape unloading in Eject mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment for cassette holder unit.
F 07	During recording mode recording signal is less than the normal condition.	Protection of the overcurrent flowing in transistor which produce the power supply for recording mode.
F 09	No communication of the main serial (between the system control and FIP driver control).	Check the system control microprocessor.

Fig. T1 Self-Test indication Display

7. SERVICE INFORMATION DISPLAY

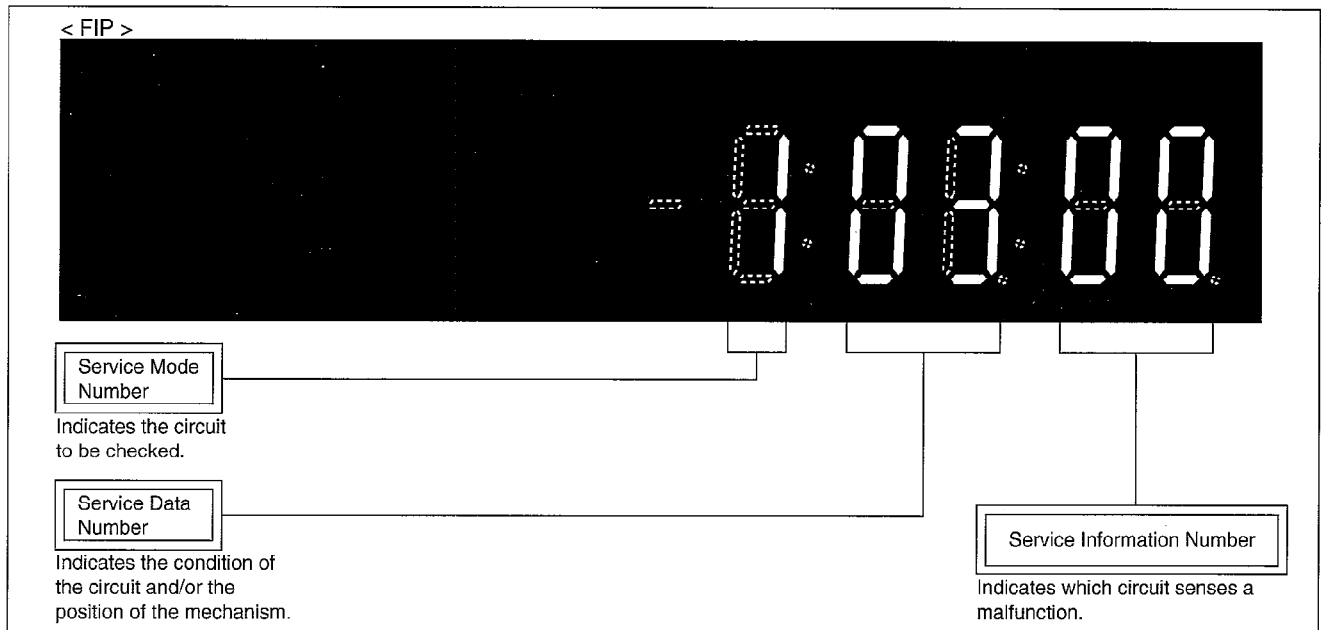


Fig. D1 Service Information Display

7-1 Purpose of Service Information Display

This information aids trouble shooting by indicating the source of the malfunction. The service mode number & service data number are used by the technician during repair while the service information can be used by consumer to diagnose malfunctions allowing the technician to provide a more accurate repair cost estimate and reduce repair time.

7-2. Turning on Service Information Display

Press FF, REW and EJECT buttons simultaneously.

In the Service Information Display, there are four digits divided into 3 functions.

The first digit indicates which of the 7 service modes that the unit is currently in.

MODE 1: Checks tape protection circuit.

MODE 2: Checks tape transport mechanism.

MODE 3: Checks mode switching operation.

MODE 4: Checks control buttons.

MODE 5: Checks capstan motor.

MODE 6: Checks cylinder motor.

MODE 7: Checks loading/unloading operation.

The second and third digits are service data which indicate the condition of the circuit or mechanism being checked.

The forth digit is the service information display. it is to be used by the consumer to help determine the source of a malfunction. The service information display operates independently of the service modes and stores the fault indication in memory for as long as AC power is not supplied.

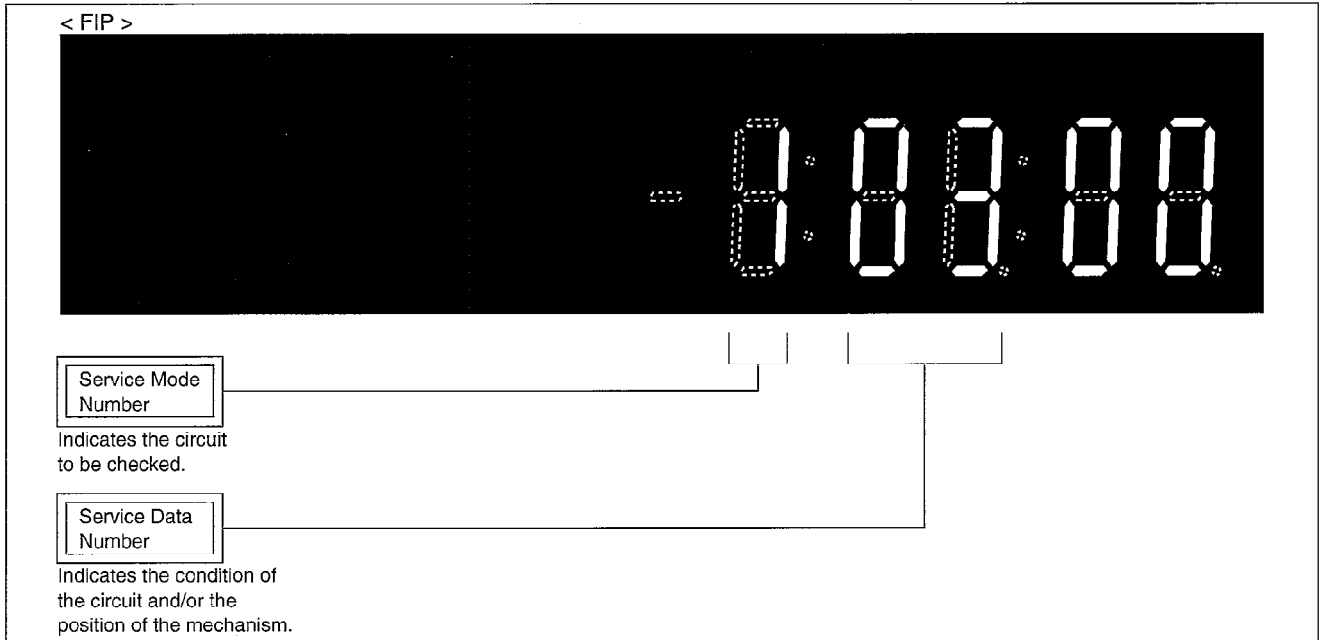


Fig. D2 Service Mode Number and Service Data Number on F.I.P.

7-3. Use of Service Modes

- (1) Turn on Service information Display.
- (2) To change Service Modes Press FF, REW and EJECT buttons simultaneously.
- (3) Mode 0: Not used.
- (4) Mode 1: Checks that the sensor LED, Supply & Take-up sensor circuits checks the circuits by blocking the light from the sensor LED to either or both Supply & Take-up Sensors. When the light is blocked to both sensors, "00" should be indicated on the service data number.
When the light is blocked to the supply sensor, "01" should be indicated.
- (5) Mode 2: Checks the mode switch circuit while indicating mechanism position.
Service Data Numbers indicate the position of the mode switch and there by the mechanism position.
- (6) Mode 3: Checks that mode switch circuit operations have been completed.
Service Data Number should indicate "00" after each mechanism operation is completed.

- (7) Mode 4: Checks the operation circuit.
Indicates if SYSTEM CONTROL IC receives the operating commands from the mode buttons and/or remote controller.
- (8) Mode 5: Checks the capstan motor circuit.
Indicates if the SYSTEM CONTROL IC has received the command to rotate the capstan motor.
- (9) Mode 6: Checks the cylinder motor circuit.
SYSTEM CONTROL IC has received the command to rotate the cylinder motor.
- (10) Mode 7: Checks the loading/unloading operation.
The loading motor rotates for loading operation when the "PLAY" button is pressed.
The loading motor rotates for unloading operation when the "STOP" button is pressed.
This mode can be displayed indefinitely until the OPERATE button is pressed.
- <NOTE> Refer to Fig. D5 for details of Service Data Numbers.

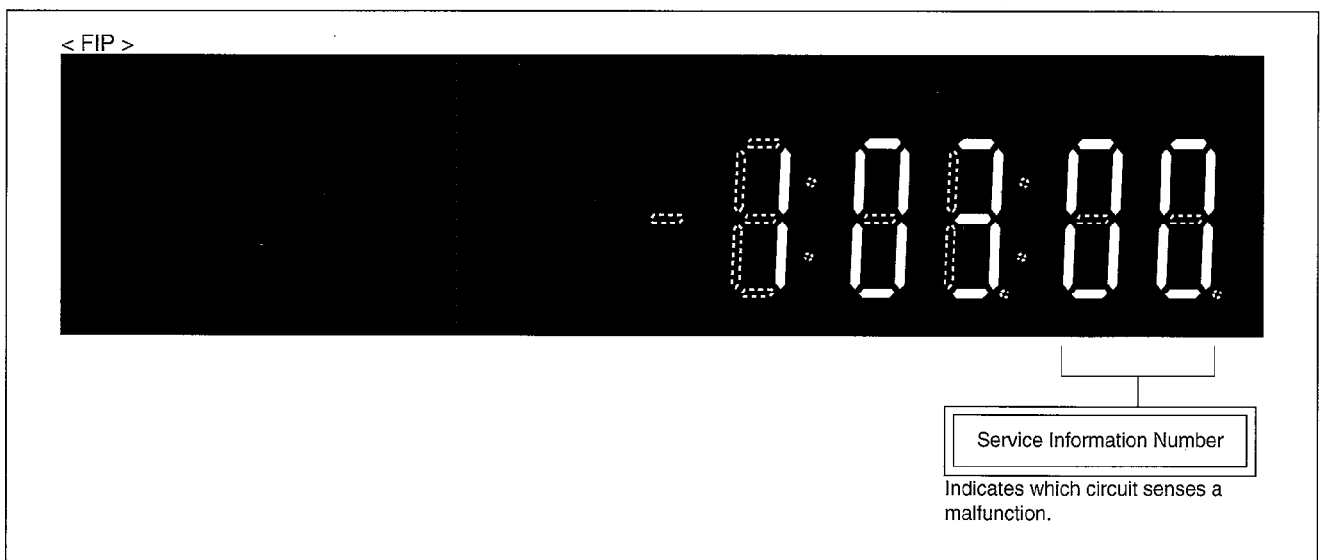


Fig. D3 Service Information Number on F.I.P.

7-4. Service Information Number

Refer to Fig. D4 for details of Service Information Number.

NOTE: The Service Information Number display is independent of the service mode display. The Service Information Number will be stored as long as AC power is not supplied (If can be displayed in the Service Mode 2.)

If a second error occurs, only the most recent error will be displayed.

Service Information Number	Malfunction
00	Normal condition (No problem)
01	Cylinder stop
02	Tape reel stop
03	Stop at position other than 04 or 06
04	Stop during unloading
05	Fault capstan rotation
06	Stop during Cassette-in/Eject operation
09	Fault of the main serial communication (Between system control and FIP driver)

Fig. D4 Detail Service Information Number

7-5. Test Mode

When the test terminals are shorted during turning off condition, the following operation will be performed after AC power is applied. Test Mode Information will be displayed on FIP instead of linear counter.

- (1) Power will be turned on automatically when AC power is applied.
- (2) The direct operation of buttons are able to be performed.

(Example) PLAY \longleftrightarrow REC, REC \longleftrightarrow EJECT

Service Mode Number	Note for checking Service Data Numbers	Service Data Numbers	Indication	Remarks
1	—	00	No light detected at either sensor	Tape not required.
		01	Tape beginning Light to Supply photo sensor is blocked.	
		02	Tape end Light to Take-up photo sensor is blocked.	
		03	Light detected at both sensors.	
2	—	00	EJECT	Tape required *1. STOP3: Pitch roller is on Capstan motor shaft *2. STOP: Pitch roller is off Capstan motor shaft.
		01	Cassette down	
		02	REV, REV SLOW	
		03	Loading/Unloading	
		04	PLAY, REC, STILL, PAUSE, CUE, FWD SLOW, STOP*1	
		05	STOP*2	
		06	FF/REW	
3	Disregard service data displayed until mechanism operation is completed. Then the display should indicate "00".	07	Intermediate position	Tape required.
		00	Any display other than "00" indicates a fault in the mode switch circuit or system.	
4	Display only when the operating button is pressed.			Tape not required.
5	Left digit only, disregard Right digit display.	8 1 Left Right Digit Digit	8, 9, u, A, —, n, L and no display indicate that the Capstan motor "PLAY" command received by system control microprocessor.	Tape required. If a symbol other than those listed is displayed, a malfunction in that circuit is indicated.
	Right digit only, disregard left digit display.	8 7 Left Right Digit Digit	1, 2, 3, 4, 5, 6, 7 indicate that the Capstan motor "CUE, FF, FWD SLOW" commands received by system control microprocessor.	
	Right digit only, disregard left digit display.	8 — Left Right Digit Digit	8, 9, u, A, —, n, L and no display indicate that the Capstan motor "Reverse, REW, Reverse Slow" commands received by system control microprocessor.	
	Left digit only, disregard Right digit display.	1 0 Left Right Digit Digit	1, 3, 5, 7, 9, A, n and no display indicate that the cylinder motor "ON" command received by system control microprocessor.	
6				Tape required. If a symbol other than those listed is displayed, a malfunction in that circuit is indicated.

Fig. D5 Service Data Display and Indication

7-6. Timing chart from Mode SW to System control IC

System control IC senses the mechanical position through the Mode SW.

Fig. D6 shows the timing for service mode number 2.

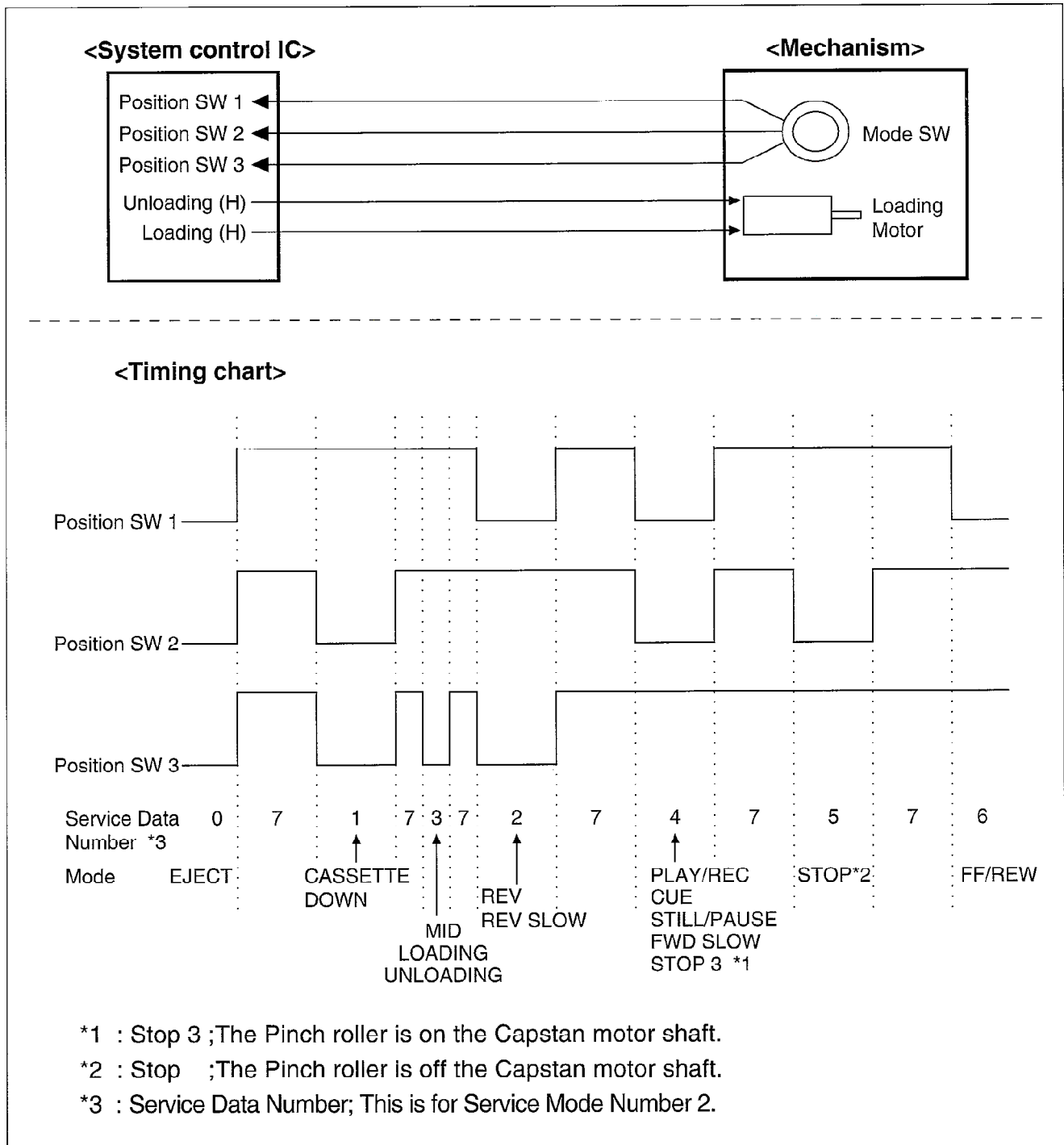


Fig. D6 Timing chart of Mode SW

8. SYSTEM CONTROL CIRCUIT & MECHANISM CONTROL CIRCUIT

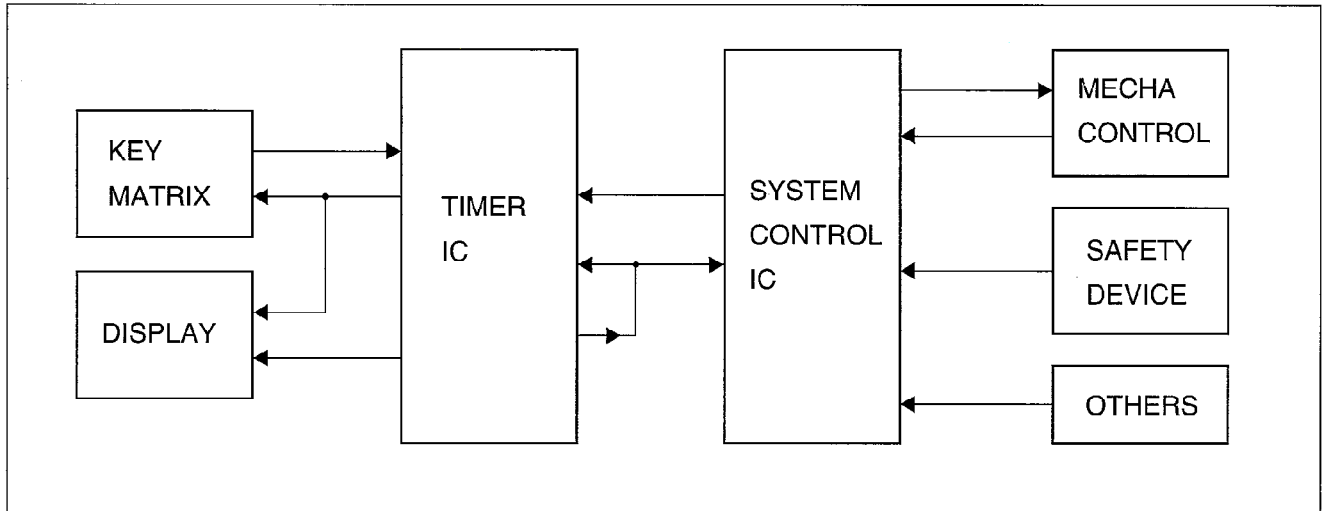


Fig. S1 Overall Block Diagram of System Control Circuit

8-1. STOP3 Specification

- (1) The STOP3 is the playback stand-by mode.
- (2) The unit is put into the STOP3 position after tape loading if the cassette tape does not have a clear leader tape.
- (3) If the unit is in the STOP3 position when the power is switched off (included the Timer stand-by mode), the unit goes to the STOP position.
- (4) If the cassette is in the unit when the power is turned on, the unit goes to the STOP3 position.
- (5) When the cassette tape has clear leader tape, the unit is in loading mode after winding up the clear leader tape by Take-up reel at the cassette down position and the unit goes to STOP3 position.

8-2. Stand-by in the STOP3 position

- (1) The unit goes to STOP3 position when the Stop mode is selected during the Play or Rec operations. The unit then loosens the tape tension by performing the Reverse Slow. The Reverse Slow corresponds to the FG 40 pulses of the capstan (irrespective of SP/LP modes). The cylinder continues to rotate.
- (2) After about 10 minutes in STOP3 mode, the unit shifts to the Stop position and the cylinder continues to rotate.
- (3) After about 10 minutes in STOP mode, the unit stops the cylinder rotation.

8-3. Supply and Take-up Sensors

Supply and Take-up photo transistors are used to sense the beginning and end of a tape. The tape has transparent leaders at the beginning and end.

When these transparent leaders enter the tape transport path, they allow infrared light from the sensor LED to reach either one of the tape end sensors (photo-transistor).

If the Take-up end sensor detects the light, the microprocessor SYSTEM CONTROL IC places the VCR in the Stop mode and then performs a short Cue.

If the Supply end sensor is triggered, the microprocessor activates the Stop mode and the Rewind mode. The Rewind mode continues until the Take-up end sensor detects the end of the tape. The tape beginning is detected by a low signal at SYSTEM CONTROL IC Take-up photo terminal. The tape end is detected by a low signal at SYSTEM CONTROL IC Supply photo terminal.

If the light is received at both sensors at same time, the cassette is ejected.

<Operation after detecting the beginning and the end of tape>

Mode	Detection of the beginning	Detection of the end
Power on→off	Short CUE	Short REW
Cassette in	Short CUE	Short REW
Loading	Short CUE	Short REW
FF/CUE	—	Auto REW
REW/REV	Short CUE	—
PLAY, REC	—	Auto REW
SLOW	—	Auto REW
Timer REC	—	Power off

Both ends of tape detection (tape cut, no cassette),

- (1) Cassette in: The cassette tape is ejected
- (2) Other mode: The unit goes to Stop mode and it is impossible to operate except EJECT key.
- (3) Timer REC: Power is turned off after short CUE is performed

8-4. Safety Tab Switch

A recorded video cassette can be protected against accidental erasure by breaking off the tab on the cassette. The cassette can now only be used for playback. To be able to record on the cassette, cover the hole with adhesive tape. If the safety tab on the cassette has been removed, Safety Tab Switch is off (open) and high signal is supplied to SYSTEM CONTROL IC Safety Tab terminal. The SYSTEM CONTROL IC will not go into the recording mode and automatically places the VCR in the playback mode.

8-5 Dew Sensor

If excessive moisture or condensation is present inside the machine (an internal humidity of more than 98%) the unit will stop if running. Until the moisture level decreases only the Eject mode will operate. To sense the humidity, a dew sensor is used. The sensor is a special variable resistor which change resistance with ambient humidity.

The sensor ranges in resistance from about 5K ohm at 90% humidity to about 50K omh at 98% humidity. Normally, the voltage across the sensor is low because of its low resistance.

But if moisture condenses inside the unit, the SYSTEM CONTROL IC voltage of Dew terminal increases to indicate a Dew condition.

Tape	Mode	Dew sensor ON	Dew sensor OFF
OUT	Power	Compulsory Power on	Power off
	Dew indication	Indicate "d" and "U10"	No indication
	Cylinder	Rotating *1	Stop
	Key operation	Not possible *2	Possible
	Cassette in	Immediately a cassette is ejected after it goes to cassette down position.	Possible
IN	Power	Compulsory Power on	Power off
	Dew indication	Indication "d" and "U10"	No indication
	Cylinder	Rotating *1	Stop
	Key operation	Not possible *2	Possible
	Cassette condition	A cassette goes to down position and is in stand-by mode.	Stand-by mode at STOP3 position.

*1: When the cylinder locks in dew mode, it will be released until dew sensor is truned off.

*2: The keys which do not relate to the tape running operation, are able to be used.

Dew sensor on: During Dew formation is detected and 80 minutes after completion of Dew detection.

Dew sensor off: 80 minutes later after copmletion of Dew detection.

8-6. Setting time for each mode

The time is set on each mode in order to protect tape and capstan driver. When the setting time is over, the mode is gone to the next mode.

Mode	Setting time	Switching mode
STILL, PAUSE	Approximately 5 minutes	STOP
CUE/REV lock	Approximately 10 minutes	PLAY
SLOW, F ADV	Approximately 10 minutes	STOP

8-7. Operation of short CUE

Short CUE stops when the Take-up photo sensor detects the black portion of the tape.

However its sensor does not detect the black portion within 4.0 ± 1.0 sec., the mode except Power on/off and Eject modes will be able to be operated after the unit stops. This is same as the timer over operation of the reel lock.

8-8. Loading/Unloading Mechanism lock

Loading and unloading times are set, and in case the mechanism locks during loading or unloading operation within the defined time, the unit detects the mechanism lock and loading motor reverses or stops.

Loading operation lock: Cassette tape is unloaded and ejected within 5 seconds.

Unloading operation lock: Power is turned off within 5 seconds.

8-9. Cassette loading/unloading lock

(1) Mechanism locks during the cassette in operation.

- ① Cassette tape is ejected approximately 2 seconds later when the mechanism locks during the cassette in operation.
- ② In case mechanism locks during eject operation, cassette tape is inserted and power is turned off approximately 2 seconds later.
- ③ When Mechanism locks during cassette in operation, power is turned off approximately 2 seconds.

In case the mechanism lock is released on the way and cassette is ejected, the unit continues the normal operation.

(2) Mechanism locks during the eject operation.

- ① Cassette tape goes to cassette down position approximately 2 seconds later and power is turned off when mechanism locks during eject operation.
- ② Mechanism locks during cassette down operation, power is turned off.

8-10. Reel lock operation

When the Supply or Take-up reel mechanism locks during the tape running, the following operation is performed.

FF/REW : Unloading and loading. The unit goes to CUE/REV mode.

PLAY/CUE/REC : Unloading till the cassette down position and loading. The unit goes to STOP3 position.

RVS PLAY/REV : Unloading till the cassette down position and loading. The unit goes to STOP3 position.

The reel pulse cycle is started to count after the mechanism mode is fixed.

In case the counted pulse cycle exceeds the defined value, the unit goes to STOP mode due to judge that lock of reel mechanism is detected.

<The value of reel lock detection time>

NTSC/SP mode

Mode	Speed (Ratio)	Time (S)
PLAY	± 1	3.5
CUE/REV	± 5	1.6

PAL/SP mode

Mode	Speed (Ratio)	Time (S)
PLAY	± 1	3.5
CUE/REV	± 5	1.6

The reel lock time in FF/REW mode is 800msec.

When the tape speed is less than 0.23m/s, reel lock is judged.

8-11. Cylinder lock

<Start rotation>

When the cylinder neither start rotating nor go to the stability rotation within 5 seconds, it is unloading under keeping the mode. In case the cylinder starts operating and stability rotation, the mechanism goes to STOP3 position.

If it is not possible, Power is turned off and cylinder trouble "H01" is displayed.

<During rotation>

The head switching pulse is supplied to the cylinder when the cylinder starts the stable revolution. In case the head switching pulse comes to the cylinder within 0.5 seconds, the cylinder lock is judged and the following operation is activated.

Timer REC: Power off

PLAY, REC: STOP

8-12. Mode transition

The relation between the present mode and operation key is shown in the following table.

PRESET MODE	OPERATION KEY							
	P SW	EJECT	STOP	REW	FF	PLAY	PAUSE	REC
P-OFF	P-ON	EJECT	—	—	—	PLAY	—	—
EJECT	P-OFF	—	—	—	—	—	—	—
STOP	P-OFF	EJECT	—	REW	FF	PLAY	—	REC
REW	P-OFF	EJECT	STOP	REV	FF	PLAY	—	—
FF	P-OFF	EJECT	STOP	REW	CUE	PLAY	—	—
REV	P-OFF	EJECT	STOP	—	CUE	PLAY	STILL	—
CUE	P-OFF	EJECT	STOP	REV	—	PLAY	STILL	—
PLAY	P-OFF	EJECT	STOP	REV	CUE	—	STILL	—
STILL	P-OFF	EJECT	STOP	REV	CUE	PLAY	PLAY	REC PS
REC	P-OFF	—	STOP	—	—	—	REC PS	*1
REC/PS	P-OFF	—	STOP	—	—	—	REC	—

*1: VISS WRITE

Pressing two keys simultaneously, the key operation is going to be ineffective.

In case the unit goes to CUE/REV lock mode by pressing FF/REW key lightly during Play mode, CUE/REV mode will be returned previous mode when FF/REW key is pressed more than 0.7 seconds.

8-13. Power on reset

When the power is turned on, the unit is going to reset and the following datas are cleared.

- (1) Position switch data
- (2) Operation mode data
- (3) Prohibition flags

In case the mechanism is in cassette down position, tape slag is removed as the initial operation and the unit goes to STOP3 position.

8-14. Linear time counter operation

The counter value will be gone up/down by counting control pulse. As for NTSC system during Play/Rec mode, counter value goes up/down every 30 pulses. As for PAL system during Play/Rec mode, counter value goes up/down every 25 pulses.

8-15. Tape speed in CUE/REV mode

	NTSC	PAL
Standard	9 times	11 times

8-16. Automatic functions

(1) Automatic Power on

- ① Under power off, when a cassette tape is inserted, power is turned on automatically and cassette tape is loaded.
- ② Under power off and a cassette tape has been inserted, when PLAY key is pressed, power is turned on automatically and goes to PLAY mode.

(2) Automatic play

When a cassette tape removed safety tab is loaded, the mode goes into Play mode.

(3) Automatic rewind

When tape running is reached to the end of tape, automatically goes to Rew mode and stops when tape running will be reached to the beginning of tape.

In case of Timer recording, short Rew is performed for 2 seconds and power is turned off when tape running is reached to the end of tape.

(4) Power off and Eject

Under power off and a cassette tape has been inserted, when Eject key is pressed, a cassette tape is ejected and power is turned off

8-17. CUE/REV lock mode

When FF/REW key is pressed lightly (less than 0.7 seconds) during Play mode, unit goes into CUE/REV mode. To release CUE/REV mode, FF/REW key should be pressed more than 0.7 seconds.

8-18. FR (Forward/Reverse) search mode

When FF/REW key is pressed during FF/REW mode, unit goes into CUE/REV mode.

To release CUE/REV mode, FF/REW key have to be pressed.

8-19 FF/REW speed

Maximum tape speed is approximately 3.0 m/s during the stable running.

8-20 FF/REW time

The tape running from the beginning to the end of T-120 type (E-180 type) cassette tape is able to be completed within 150 seconds.

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